GAMAKA IN ĀLĀPANA PERFORMANCE
IN KARNATIC MUSIC

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CHAPTER I

INTRODUCTION

Ālāpana[1] is one of the most interesting and important entities of Karnatic (South Indian classical) music. Ālāpana is improvised within[2] the framework of a rāga (germinal melody) and its idiom. It is rhythmically free. It is abstract, using neither text nor solfège. Ālāpana is improvised in the performer's individual style within the norms of the Karnatic tradition. Ālāpana may be performed briefly or elaborated at great length. It may take a form (using the word 'form' in a broad sense) conceived as sectional. In ālāpana the performer reveals not only the elements, but also the essence (bhāva) of the particular rāga.

Purpose of the Study

As a performing musician trained in the Karnatic tradition, I became interested in using some methods and techniques developed by ethnomusicologists to study the ālāpana, its elements, and how the essence of a rāga is revealed. While undertaking this,[3] and after

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[1] Sanskrit (and other Indian language) words, being essential to this study, are not underlined. Their meaning or referent is made clear in the first occurrence in the text. A glossary is provided in the Appendix.

[2] Explaining relationships of ālāpana to rāga in the English language is difficult and requires different words (e.g. 'on', 'in', 'of') in different verbal contexts.

[3] While these studies were in process I became aware of dissertation research in ālāpana being undertaken simultaneously by T. Viswanathan. I have had no opportunity to get acquainted with his work and look forward to comparing our findings.

making basic transcriptions of selected performances, I became increasingly aware of the significance of one element, namely gamaka. Gamaka is the 'shaking' and other very rapid ornamentation of an individual tone by the voice or melodic instrument[4] which is indispensable to Karnatic music, both composed and improvised.

As a teacher and performer of this music, I have been aware for many years of certain elements of ālāpana and the rāga on which it is performed. A performer learns aspects of rāga, the ways of singing certain svaras (tones), the giving of gamakas to certain tones, the appropriate voice quality and dynamics, and the proper selection of tones in a phrase, etc. Among South Indian music lovers, this learning is often spoken of as something known by intuition. For example, I was aware of making different kinds of gamakas at expected points but never had visualized them as different 'shapes'. The study reported here makes an explicit visual and quantitative classification of the various shapes of gamakas in selected recorded performances of three rāgas. The analysis is essentially quantitative, based on data from nine performances. It is restricted to tabulations of tones and of classified forms of gamakas in order to be as objective as possible--specifically to avoid being influenced by the expectations I might bring from previous experience.

The objectives of this paper are: first to transcribe ālāpanas displaying the ornamentation of the melodic line, and then using these transcriptions, to analyze the kinds and uses of gamakas in the selected

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[4] Hereafter, the principal melodic part will usually be referred to as the voice although it may be performed on an instrument.

performances. The analysis is concerned with the classification of kinds of gamakas, the similarity or difference of the kinds of gamakas employed by several musicians performing an ālāpana on the same rāga, and the similarity or difference in the kinds of gamakas employed by a single musician in performing an ālāpana on three different rāgas. Before proceeding to the analysis, however, a brief statement should be made about the place of ālāpana in the context of Karnatic music and about the meaning of some terms as they will be applied in this study.

Karnatic Music

Karnatic music consists of two major kinds: 1) kalpita sangīta which is composed prior to performance by a musician other than the performer, and 2) kalpanā sangīta which is improvised during performance. Kalpita sangīta embraces a variety of forms with text and tāla (time cycle). Gīta, svarajati, jatisvara, tāya, and prabanda are used only for training musicians. Varna is used both for training and as a "warm up" piece in concert. Kriti, kīrtana, pada, jāvali, and tillāna are important forms in the concert repertory.[5]

Kalpanā sangīta (also called manodharma sangīta) embraces several varieties of improvised music in addition to ālāpana. Neraval (also called sāhitya prastāra) is improvised on a section of a kriti (text and tāla are retained as composed; variations are created by the performer within these limits). Kalpanā svara which usually follows a neraval (sometimes a kriti) is solfège improvisation. Śloka (or a comparable form with a text in a South Indian language other than

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[5] See further, Ayyangar 1965:9-13.

Sanskrit) which is performed towards the end of a concert, employs several rāga phrases to reveal the meaning of the devotional text.

Also among the varieties of kalpanā sangīta are three which are usually performed in sequence: rāga, tāna, and pallavi (in other contexts these designations have other meanings or referents).[6] In this context, the word 'rāga' is commonly used by musicians to mean ālāpana and usually implies an enlargement of it (i.e. sung at greater length than the characteristically brief ālāpana preceding a kriti).[7] Tāna, like ālāpana, has no tāla, however, a definite pulse is indicated through the use of vocables (e.g. "anam-tom-nom"). Pallavi which is similar to neraval, has tāla; its basic structure is retained throughout the performance while rhythmic as well as melodic improvisation creates variations on it.

Although competent musicians are expected to know and to be able to perform all the varieties of improvised music mentioned above, some specialize in one or another of them. As a verbal message can consist of a sentence, a paragraph, a page, or a book, so an improvisation on a rāga may vary in length.[8] Whether brief or extended, it may be more or less complete depending on how the improvisation is done and how the rāga is treated. It is widely recognized that the length of an improvisation is of less importance than the skill and completeness of the statement of the rāga on which it is based.

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[6] For rāga, see Chapter II. For tāna, see Sambamoorthy 1963:16-17. For pallavi, see Ayyangar 1965:35.

[7] To minimize confusion, the designation 'rāga' with this referent will not be used elsewhere in this study; the designation 'ālāpana' will include it (except in citing a title as in the third corpus item).

[8] This analogy was suggested by one in Sadagopan 1970:45.

Ālāpana

The analysis in this study is restricted to one type of kalpanā sangīta, namely ālāpana. Ālāpana is an improvisation created on a rāga by the performer (or more accurately, performers, because the normal performing ensemble includes not only the ever-present drone, but also an accompanying melodic part which quite literally follows after the principal melodic part and has some, although minor independence between phrases of the principal performer's part). The performer's objective in performing ālāpana is twofold: first, to reveal the essence of a rāga, and secondly, to create skillful melodic patterns related to the ārōhana (ascent) and avarōhana (descent) of a rāga, or a combination of ārōhana and avarōhana. In executing the melodic phrases, the performer follows closely the characteristics and norms of a rāga.

In ālāpana, a performer concentrates on certain tones that are central to specific pitch areas and tessituras. The melodic development of an ālāpana focusses on these tones and pitch areas in turn. The portion devoted to one tone or pitch area constitutes a section.

The length of an ālāpana performance depends on what will follow, the occasion, and the mood of the performer. At present (and this may differ from former performance practice), it may be as brief as, perhaps, one minute, or as long as an hour or even longer.

Although ālāpana has neither text (in the sense of meaningful word phrases or verses) nor solfège, syllables are sung to project tone in voice. These syllables are not prescribed--the choice of both syllable and their placement in the melodic line is determined by the singer. The articulation of syllables constitutes a resource for the singer to

project the characteristics and essence of the rāga. (Instrumentalists use articulations appropriate to their instrument in as closely similar a way as possible--so much so that singers almost 'hear' syllables in the playing of a flute or violin.) For a complete study of ālāpana as a style or form, an analysis of the types and placement of these syllables would be required. For this study, however, their significance is limited to the articulation of a syllable within the duration of a single pitch that results in the perception of a new tone occurrence.

Gamaka

Gamaka is an essential aspect of Karnatic music. Its importance is stressed in many of the older texts and reconfirmed in recent studies. In older treatises on Indian music, considerable attention was devoted to the concept of gamaka in which music without gamaka was compared, among other things, to a moonless sky, a waterless pond, and a flowerless vine. Gamakas have been variously classified into groups ranging in number from six to 22. Of these, two classification schemes, panchadasa (15) gamakas and dashavidha (10) gamakas,are the most widely known. In these, certain groupings are assigned names and in some cases symbols. For purposes of this study, these classification schemes are not adequate because the criteria for classification and the level of specificity vary within each system, and because not all gamakas are classified or classifiable within them.[9]

Gamaka, in the broad meaning of ornamentation, includes controlled 'shaking', articulating, sliding, and other manipulating of tones by the

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[9] See further, Sambamoorthy 1963:133-140.

voice (or instrument) within the rāga idiom. The tone of certain svaras is not conceived separately from the gamaka. In fact, in some rāgas, it is the svara (including its integrally associated gamaka) that differentiates between two or more rāgas whose scales are the same. Yet there are considerable differences in individual styles of singing and playing. How many shakes and what tones are held vary from one performer to another. But how much and to what degree? It is necessary to go beyond such general statements for a better understanding of gamaka in ālāpana. That is the aim of the present study.

Learning to Perform Karnatic Music

As mentioned above, ālāpana is performed on a rāga. Therefore to perform an ālāpana it is necessary to have learned thoroughly the idioms of the rāga on which it will be sung. To grasp fully a particular rāga, several forms must have been learned in it. These forms are presented to students in levels of increasing difficulty.

Indian music is taught aurally. Although kritis and some other forms are notated in Indian solfège, the written form is little more than an aid to memorization that has already taken place--it is for future reference, to assist recall.

One of the more important aspects of learning Karnatic music is the singing of solfège. The basic technique of singing (or playing an instrument) is achieved by learning (including memorizing) exercises which develop facility in svaras (i.e. facility and agility in the singing of tones per se and also in the singing of solfège syllables to the tones).

Then several exercise pieces are learned, including some with text (e.g. gīta, svarajati, and jatisvara). The selection includes pieces in different rāgas. Through the exercises and simple forms, the student not only learns how to use the voice (or instrument) with technical facility, but also is exposed to different rāgas.

The study of varna follows. Varna is a very important form in the learning process because it contains all the melodic elements of rāga: the uses of tones, gamakas, and durational elements. Varnas with both solfège and text are composed in both simple and difficult tālas and in many rāgas. Varna is believed to be the key to learning rāga idioms.

Next in the learning sequence is the kriti, a very sophisticated Karnatic form. Although kritis are memorized, there is a wide scope for a performer to interpret them in a personal style. Within the tradition the rendering of kriti is considered an art in itself.

Learning pada follows. Pada is a very highly regarded form because it emphasizes the bhāva and other essential elements. Pada is characteristically in a 7-beat tāla and a relatively slow tempo. Because of the slow tempo, the musician is presented both the opportunity and the necessity of being clear in the proper use of gamakas and of developing mastery in the proportions of shakes, in dynamics, and in a certain desired voice quality. The aesthetic element of feeling is also essential to its performance.

When able to perform several kritis and padas in a given rāga, a student is very well trained in the use of gamakas and other essential elements of that rāga. He is expected to be able not only to imitate the teacher exactly, but also to instantly transform an abstract melody

into solfège in his mind--a process known as svara jñāna (knowledge of svara). These skills are essential to memorization.

In contrast to the forms mentioned above, an ālāpana as such is not taught in the Karnatic tradition although short phrases of a rāga, both with and without solfège, are sometimes taught as independent units to be imitated but not closely memorized. Listening may be considered the most important part of the learning process in the Karnatic tradition. It includes listening to the teacher in lessons and the teacher's performances, and also listening to performances of other musicians. Through this a student develops a mental model of a rāga's idiom including, but not limited to, the use of tones with and without gamaka, and duration values within small melodic units. This, in conjunction with the memorization (also primarily through listening) of several kritis, varnas, padas and other forms in several rāgas constitutes the basis for learning the vocabulary of rāga. In this type of learning, the ability to improvise evolves naturally and without special effort, so that at some point in the learning process, a student is found to be competent to perform ālāpana.

Some Competencies Expected of Performers

Performers are expected to be competent in the components of Karnatic music. Among the principal components are: śruti; laya; gamaka; dynamics; sense of proportion; use of tones; voice quality; and mood, feeling, and expression. All are highly valued in the tradition. They are common to both kalpita and kalpanā sangīta, however the comments below focus on their relevance to ālāpana.

Śruti is an absolute sense of pitch (as used here, the word 'absolute' means solid, secure, and controlled rather than pitch recognition). The drone is essential to śruti. It is produced on the tambūra, an instrument whose open strings are plucked constantly throughout a performance providing not only their fundamental tones (tonal center and perfect fifth) but also their harmonic series. It is expected that the performer be in absolute harmony (as used here, the word 'harmony' means consonance) with the tambūra tones. Further, it is believed that the performer should be in harmony with each individual tone and interval of the rāga.

Laya is rhythm, and within the tradition-as-a-whole it may be as important as śruti. In Sanskrit it is stated: "śruti māta laya pita" ("śruti is the mother, laya the father"). However, because ālāpana is rhythmically free, laya is not relevant to ālāpana performance.

Gamaka which is central to this study is discussed in detail in Chapter III.

Dynamics contribute significantly to revealing the essence of a rāga through emphasizing certain features of melodic units. However, except for two kinds of accents, this component is not analyzed in the present study.

A sense of proportion is required for the performer to achieve a balance of gamaka tones, non-gamaka tones, and held tones (i.e. tones of proportionately long duration) in each of the small units which comprise the larger units of both composed and improvised music. There would be no balance if all tones were given gamaka, or if there were no long tones to contrast with the short tones.

Tones of the rāga are selected by the performer improvising a melodic unit of ālāpana. Svaras are chosen that are appropriate to the rāga being presented. Only certain tones are used at the beginning of an improvisation; other tones are introduced later. In any section or smaller unit, one melodic feature or motif is taken as a base and a few tones added for variation and elaboration.

Voice quality in the Karnatic tradition is unique. The naturally gifted voice is highly regarded, but so also is the trained voice which is capable of producing all the required techniques. If either is considered more important than the other, the mastery of technique is the more highly valued. Elder singers continue to be respected as performers even if their vocal timbre gives evidence of their advanced age.

Mood, feeling, and expression are in the realm of aesthetics. To perform composed music or to improvise properly and effectively, it is necessary for the musician to be in harmony with all elements of the music and to have mastery of the several techniques. When used in performance, these techniques contribute in some degree to producing a mood or feeling. Also contributing to establishing mood and feeling are the texts of songs most of which (e.g. kriti and kīrtana) are religious in nature. In some forms (e.g. pada and jāvali) the texts are love themes--or, more accurately, imply both religious fervor and human love. It is believed that music, as one of the fine arts, is a path for attaining salvation (mukti). It is expected within the tradition that a musician will both feel and communicate bhakti (devotion) and rasa (mood) in performing. These two aspects--technique and feeling--are not really

separate or independent of one another, but are complementary. Since mood and feeling are complex and subjective--and to a degree culturally determined, learned, and responded to--perhaps they can be experienced only in performance.

This study concentrates on only one component, namely gamaka. The focus is on the various forms of gamaka, and the relationships among the tones that are ornamented, unornamented, and held. Because only three rāgas are examined, specific conclusions can be applied only to them.

CHAPTER II

DESIGN OF THE STUDY AND THE PROCEDURES USED

The basic approach followed in this study was to select three representative recorded performances of ālāpana in each of three rāgas, transcribe them, classify the varieties of gamakas used, tabulate their distribution and association with tones, and compare these data to seek to delineate associations of gamaka with rāga. In this chapter, I will discuss the selection of performances for study and the method of transcription.

Choice of Corpus

The focus of the study is on ornaments used in ālāpana, one form of improvised music in the Karnatic tradition. For such a study to yield valid results, it is essential that the music examined be representative of the tradition. Therefore, more important than the choice of any particular rāga from the very large number comprising the South Indian system, is the selection of performances by musicians of acknowledged authority and ability. Therefore, the primary consideration was to obtain nine authoritative performances, three in each of three rāgas. It was decided to select performances already recorded to assure that no performance was done to illustrate a hypothesis, but rather had been performed in another context. Insofar as possible, performances on readily available commercial discs were selected to enable readers of this study easy access to the sources of data. Finally, an important though secondary consideration, was that the recordings be of sufficient

technological quality for tones, pitches, and ornaments to be accurately determined.

The corpus for study consists of nine ālāpanas, three in each of three rāgas. Among the available recordings, it was not possible to obtain a recording of an ālāpana in the same three rāgas by the same three performers. The musicians represented in the corpus, listed alphabetically according to the name by which they are most frequently called by South Indian music lovers, together with the rāgas of their performances are:

Performer	Rāga I Shankarābharana	Rāga II Pūrvikalyāni	Rāga III Madhyamāvadi
Ariyakudi Ramanuja Iyengar		X	
D. K. Pattammal			X
Ramnad Krishnan			X
Semmangudi Srinivasa Iyer	X	X	
M. S. Subbulakshmi	X	X	X
T. Viswanathan	X		

One performer, M. S. Subbulakshmi, is represented by a performance in all three rāgas. Part of the study is devoted to a comparison of gamakas in the three selections of her singing. To facilitate this, her performances are presented first in the transcription and analysis of each rāga. The order of presentation of the other performances is according to the age and experience of the performers as is expected in the tradition. Details of the performances and the recorded sources are given in Chapters IV, V, and VI.

All but one of the selections are vocal. In the Karnatic tradition instrumental music closely follows vocal style and technique, and any

melodic line can be accurately sung. As compared to the human voice, instruments have advantages in range and speed, and limitations in variation of tone quality and directness of communication through pronunciation of text or other syllables. However since singing underlies the study of all classical melodic instruments in the tradition, instrumental performance is directly comparable with, and generalizable to vocal performance in studying gamakas.

Tonal Systems in Karnatic Music

The tonal systems of Karnatic music have been written about quite extensively by Indian scholars, therefore they will not be discussed in detail here. Some relationships among the Karnatic systems, and some correspondences (near-equivalents) to Western systems are shown in Figure 2.1. This figure presents the svara names of the 22-microtonal system with cent values for each tone,[1] the 16-tone, 12-tone, and 7-tone systems, and their solfège abbreviations. There are seven syllables in Indian solfège. Subscripts designate higher- and lower-pitched tones of the same solfège syllable. Asterisks indicate enharmonic equivalents.

The solfège syllables are usually transliterated as: Sa, Ri, Ga, Ma, Pa, Da (more accurately, Dha), and Ni. However, in the transcriptions in order to conserve space, and in the analyses where the meaning is clear from the context or where a solfège syllable could be confused with a code item of the gamaka types, solfège is identified by the respective capital letter only, thus: S, R, G, M, P, D, and N.

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[1] The cent values are taken from Sambamoorthy 1951:25.

Figure 2.1

Svarasthāna and Approximate Western Equivalents

KARNATIC								WESTERN			
								Chromatic Scale		Diatonic	
Number, Name, Solfege and Subscript in 22-Svara System		Value in Cent System	Number and Name in 16-Svara System and Relation to 7-Tone "Scale" Names		Number and Name in 12-Svara System and Relation to 7-Tone "Scale Names			Number of Scale Degree	Note Name From C	Solfège	Note Name From C
22 Chyuta Shadja Nishādha	Ni$_4$	1,100									
21 Kākili Nishādha	Ni$_3$	1,088	16 Kākili Nishādha	Ni$_3$	12 Kākili Nishādha	Ni$_2$	7 Nishādha Ni	12	B	ti	B
20 Kaishiki Nishādha	Ni$_2$	1,018	15 Kaishiki Nishādha 14 Shatśruti Dhaivata *	Ni$_2$ Da$_3$	11 Kaiśiki Nishādha	Ni$_1$		11	B♭		
19 Kōmala Kaishiki Nishādha	Ni$_1$	996									
18 Chatuśruti Dhaivata	Da$_4$	906	13 Sudha Nishādha 12 Chatuśruti Dhaivata *	Ni$_1$ Da$_2$	10 Chatuśruti Dhaivata	Da$_2$	6 Dhaivata Da	10	A	la	A
17 Tiśruti Dhaivata	Da$_3$	884									
16 Dviśruti Dhaivata	Da$_1$	814	11 Sudha Dhaivata	Da$_1$	9 Sudha Dhaivata	Da$_1$		9	A♭		
15 Ēkaśruti Dhaivata	Da$_1$	792									
14 Panchama	Pa	702	10 Panchama	Pa	8 Panchama	Pa	5 Panchama Pa	8	G	so	G
13 Chyuta Panchama Madhyama	Ma$_4$	612									
12 Prati Madhyama	Ma$_3$	590	9 Prati Madhyama	Ma$_2$	7 Prati Madhyama	Ma$_2$	4 Madhyama Ma	7	F♯		
11 Tīvra Madhyama	Ma$_2$	520									
10 Sudha Madhyama	Ma$_1$	498	8 Sudha Madhyama	Ma$_1$	6 Sudha Madhyama	Ma$_1$		6	F	fa	F
9 Chyuta Madhyama Gāndhāra	Ga$_4$	408									
8 Antara Gāndhāra	Ga$_3$	386	7 Antara Gāndhāra	Ga$_3$	5 Antara Gāndhāra	Ga$_2$	3 Gāndhāra Ga	5	E	mi	E
7 Sādhārana Gāndhāra	Ga$_2$	316	6 Sadhārana Gāndhāra 5 Shatśruti Rishabha *	Ga$_2$ Ri$_3$	4 Sādhārana Gāndhāra	Ga$_1$		4	E♭		
6 Kōmala Sādhārana Gāndhāra	Ga$_1$	294									
5 Chatuśruti Rishabha	Ri$_4$	204	4 Sudha Gāndhāra 3 Chatuśruti Rishabha *	Ga$_1$ Ri$_2$	3 Chatuśruti Rishabha	Ri$_2$	2 Rishabha Ri	3	D	re	D
4 Tiśruti Rishabha	Ri$_3$	182									
3 Dviśruti Rishabha	Ri$_2$	112	2 Sudha Rishabha	Ri$_1$	2 Sudha Rishabha	Ri$_1$		2	D♭		
2 Ēkaśruti Rishabha	Ri$_1$	90									
1 Shadja	Sa	0	1 Shadja	Sa	1 Shadja	Sa	1 Shadja Sa	1	C	do	C

*Enharmonic equivalents

Rāga Classification

Karnatic rāgas are divided into two categories: 1) janaka (parent rāga) and 2) janya (derived rāga). The parent rāga is also known as mēlakarta and as sampūrna. There are 72 mēlakarta rāgas.[2]

A parent rāga has three characteristics: 1) it has seven tones in both ascent (ārōhana) and descent (avarōhana); 2) the tones are in stepwise order (i.e. no skips or changes of direction); 3) the same tone intervals are used in both ascent and descent. Shankarābharana, Rāga I of this study, is a sampūrna rāga. The tones of its scale are: Sa, Ri_2, Ga_2, Ma_1, Pa, Da_2, Ni_2, Sa; Sa, Ni_2, Da_2, Pa, Ma_1, Ga_2, Ri_2, Sa.

A janya rāga is derived from a parent rāga. Janya rāgas are divided into two types: 1) upānga rāgas which take the same tones and śruti pitches as the parent rāga; and 2) bhāshānga rāgas which, in addition to taking the tones and śruti pitches of the parent, take one or two additional pitches. The derived rāgas in the corpus of this study are upānga; no bhāshānga examples are included. Upānga rāgas are further subdivided into vakra and varja. In the former, tones in ascent or descent or both are not in stepwise order--as the name suggests, they are 'crooked'. In some vakra rāgas, some tones are also absent in either ascent or descent or both. Rāga Pūrvikalyāni, Raga II of this study, is vakra, with the irregularity in ascent only, Ni being absent. The tones of its scale are: Sa, Ri_1, Ga_2, Ma_2, Pa, Da_2, Pa, Sa; Sa, Ni_2, Da_2, Pa, Ma_2, Ga_2, Ri_1, Sa.

In varja rāgas, some tone is missing in ascent or descent or both. There are two varieties: a 6-tone scale called shādava, and a 5-tone

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[2] See further, Sambamoorthy 1964 and Kabir 1974.

scale called audava. Rāga Madhyamāvati, Raga III of this study, is audava. The tones of its scale are: Sa, Ri$_2$, Ma$_1$, Pa, Ni$_1$, Sa; Sa, Ni$_1$, Pa, Ma$_1$, Ra$_2$, Sa.

There are further complexities possible in several combinations of vakra and varja rāgas. None is included in this study.

Method of Transcription

Disc recordings were dubbed onto tape at 7.5 inches per second on a TEAC Model 1500 tape deck, or in some cases a Revox A-77. One or the other of these two machines were used for playback in the process of transcribing the principal melodic line. Because the intention of the study is to analyze the principal performer's part (not the total ensemble performance or the relationship of the principal performer to the accompaniment) the accompanying parts are not transcribed.

The melodic line was transcribed on graph paper by hand as perceived by ear. The Indian solfège was supplied along with the graphic representation. The syllables used for melodic articulation were transcribed as heard. The graphic line can be read by itself without reference to the Indian solfège written below it. Similarly, the Indian solfège can be read independently of the graphic line (and may facilitate following the line by readers more accustomed to Indian notation).

The first step was to write (i.e. draw) the basic melodic line along with the solfège and articulation syllables. Next the tape was replayed and each gamaka was carefully and repeatedly listened to using both normal (7.5 ips) and half (3.75 ips) speeds. The latter, slower speed permitted more accurate classification of the ornaments, for at normal performing speed each phrase and gamaka occurs at a faster rate than the

ear can retain while the mind analyzes for a high level of specificity and calculates the graphic representation. Repeated replaying and listening is necessary, and continual checking essential to this process.

Each gamaka was transcribed using Indian solfège notation. After hearing the recorded extract several times, it was useful to sing each gamaka to facilitate understanding of its exact 'shape' before writing it on paper. This is a time-consuming process if gamakas are to be accurately represented. A musical example of only a few minutes' duration may contain hundreds of tones and gamakas, so it takes many hours to transcribe.

Of the syllables used for articulation, the majority were heard as containing low central 'a'. Other vowels were heard as high front 'e' and diphthong 'au'. Among the consonants, dental nasal 'n' is predominant. Other consonants were heard as voiceless dental 't', semi-vowel 'y', voiced unaspirated dental 'd', and semi-vowel 'i'. The syllable inventory includes 'a', 'n', 'na', 'ra', 'ta', 'la', 'no', 'wo', 'aw', 'now', and 'yi'. Combinations of these, such as 'ran', 'tana', 'tara', 'tadari', and 'tarara' are used to punctuate the melodic phrases and smaller melodic units within a phrase. Each performer has a unique style of using such syllables to help reveal the essentials of rāgas. The performer displays the skill of vocal or instrumental techniques through these sounds. In the flute performance in the corpus, the articulations have been transcribed as syllables corresponding to vocal performances (although the performer might have made a different choice of syllables if he had been singing).

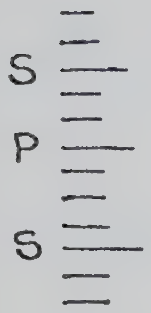
In the graphs, the melody of the principal performer is transcribed;

the accompanist's playing (simultaneous and interspersed) is not. The duration of each 'silence' (i.e. silence in the principal performer's part; tone is being produced in the accompanist's part) is shown as empty space on the graph. In addition to 'silence' between phrases (during which, of course, breath is taken) there are some instances of very quick breath-taking (catch breaths) within a single melodic unit. It was not possible to stop the watch and restart it within such a brief time. On the graph this is shown as a discontinuity in the line but with virtually no empty space.

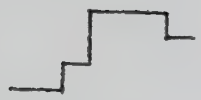
The duration of each melodic unit designated as a phrase, as well as that of each 'silence', has been measured by stopwatch. For example, in Rāga Shankarābharana performed by M. S. Subbulakshmi (hereafter referred to as Rāga I, Performer 1) there are 125 measured periods--63 phrases and 62 silences. Because of accumulation of human reaction time in manually starting and stopping the watch, there is a discrepancy of a few seconds between the sums of the durations of the individually measured units (phrases and silences) and the total measured elapsed time of the performance. The discrepancy is considered irrelevant to the purpose of the study. The total elapsed time is indicated with the data on source of recordings.

Figure 2.2

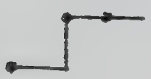
Key to Graph and Special Symbols



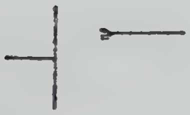
Staff. Height accommodates pitch range employed. Sa and Pa identified by longer lines and solfège. Number of lines between Sa and Pa accommodates svaras of rāga. (Right and left margins.)



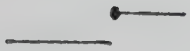
Melodic line. Pitch on vertical axis; duration on horizontal axis, ½ inch = 1 second.



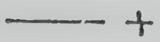
Syllable articulation (at beginning and within pitch).



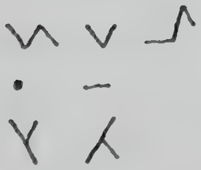
Phrase ending; 'silence'; beginning of new phrase.



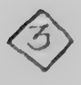
Short breath within phrase.



Continuation of phrase to next score. (Right margin.)



Gamakas, accents, stylistics. Types A, D, E, G above melodic line; types B, C, F, H, I below melodic line. (See Figure 3.1 for complete symbol display.)



Phrase number.

Figure 2.2 (Continued)

Key to Graph and Special Symbols

S_RM_G	Melodic line in solfège. [illegible] of the alap
$SR^{G^{M}}\ P^{D^{N^{S}}}$	Solfège stacked to conserve space.
PMG___	Continuation of phrase to next score. (Right margin.)

CHAPTER III

CLASSIFICATION OF GAMAKA

Gamaka, an essential element in Karnatic music, is proportionately more prominent in the performance of ālāpana than in the performance of forms such as kriti or kirtana in which attention is given to the poetic text and its meaning, and to tāla and its elaboration. Furthermore, the choice and treatment of gamaka may be subject to fewer constraints. These were significant considerations in the decision to limit this study of gamaka to its use in ālāpana.

The writer classifies gamaka into types and subtypes by a consistent (and admittedly arbitrary) approach to shape. The shapes are symbolized for graphic representation and coded for quantification and comparison. The graphic symbols and alphameric code were specifically developed for the inventory of gamakas found in this corpus of nine performances in three rāgas--Shankarābharana, Pūrvikalyāni, and Madhyamāvati. However, the principles underlying the symbols and code are systematic and in the future could be adapted to a larger inventory which undoubtedly would be found in a larger corpus of performances by other performers and in other rāgas. It should be noted here that the level of specificity of pitch designations is that of the solfège tones. A future study, perhaps with machine transcription, might analyze pitch in the cent system and compare results with the 22-śruti microtone system.

In preliminary analysis of the corpus selections, attention was focussed on ornamentation involving prominent use of more than one pitch

--i.e. ornamentation that is almost invariably called 'gamaka' by musicians and scholars. It was found that many kinds (shapes) of these could be classified into four types based on the direction of initial pitch movement in relation to the principal pitch. These are assigned code designations type-A through type-D.[1] In type-A the initial movement is a slide from a higher tone down to the principal tone; in type-B from the principal tone down to a lower tone; in type-C from a lower tone up to the principal tone; and type-D from the principal tone up to a higher tone.

Ornamentation involving special vocalization within one tone occurrence (i.e. within the duration of a single tone) is also essential to Karnatic style and is embraced within the broad concept of gamaka. When differentiating between ornamentation involving prominent use of more than one pitch and that involving ornamentation within a single tone, the former is referred to as 'gamaka' and the latter as 'accent'. Two types of accents were found in the corpus: a glottal in singing (or comparable stop in playing an instrument), and an articulation produced deep in the throat. These are assigned code designations type-E and type-F respectively.

In refining and finalizing the transcriptions, it was decided that rapid sliding in pitch joining one tone to the next (suggesting a gamaka in the restricted meaning of the word but shorter in duration) should

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[1] Hereafter the word 'type' hyphenated to a capital letter (type-A) will refer to the broad category including subtypes and varieties. When not followed by a hyphen, the word 'type' follows general usage and is applied to broad types, subtypes, or varieties. The context should make the referent clear.

be included in this study because such ornamentation seems significant to the style and is embraced within the broad concept of gamaka. When differentiating a rapid slide from the other types mentioned above it is referred to as a 'stylistic.' Although four types of stylistics would seem to be possible (one corresponding in contour to each of types A through D), only three were found in the corpus. They are assigned code designations type-G through type-I. Type-G corresponds in shape to the gamaka Aal, type-H to the gamaka Cal, and type-I (with only one occurrence in all nine performances) to the gamaka Bal.

The decision to classify each instance of sliding pitch as a major type gamaka (type-A through type-D) or as a stylistic has been determined by the writer's judgment.

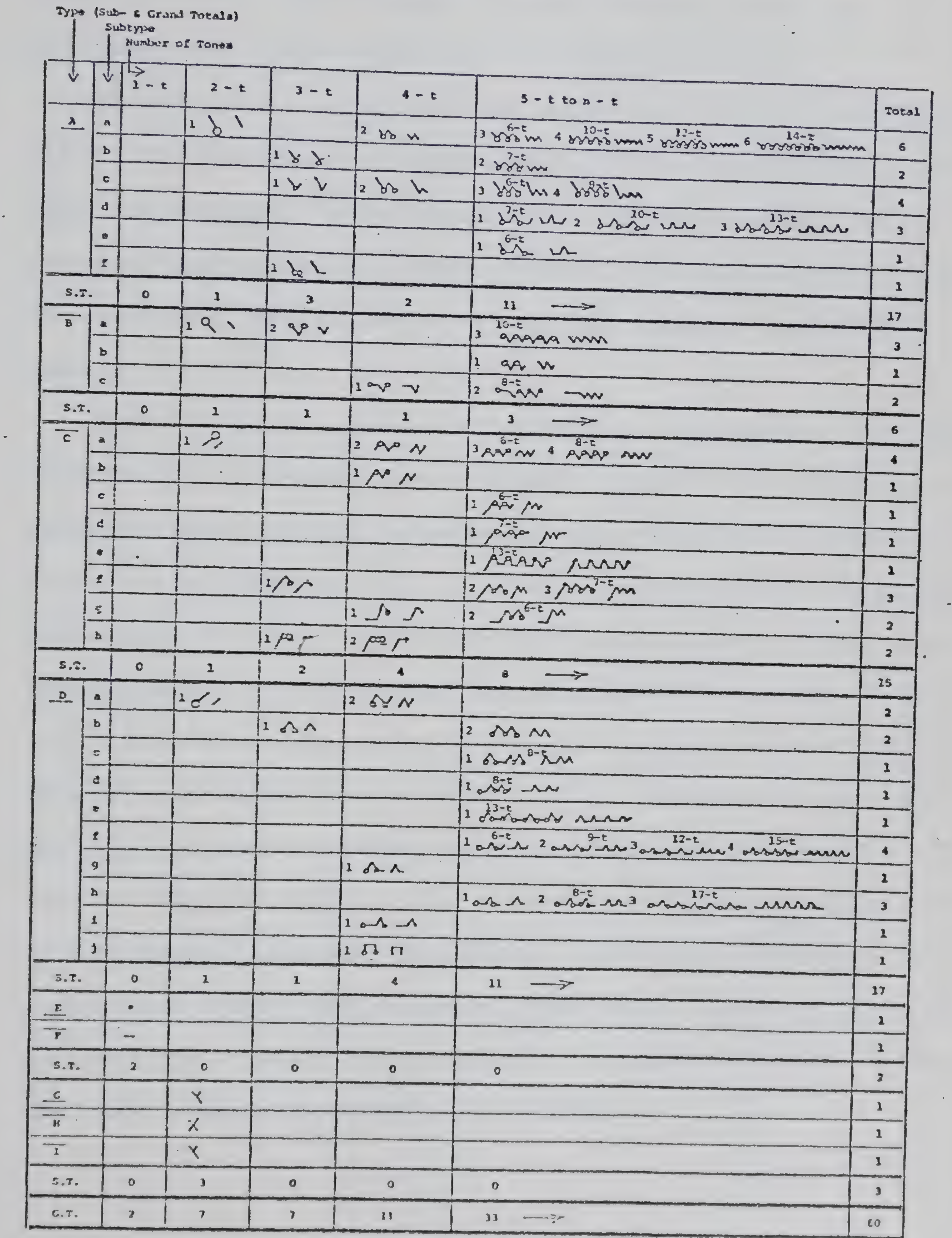
Alphameric Code and Graphic Symbols

The 60 kinds of ornaments used in the performances of the corpus of this study are displayed in Figure 3.1. The first digit (capital letter) is placed in the column on the left. Accents and stylistics have only this one digit because these ornaments have no subtypes or varieties (within the level of specificity of this study). The second digit (lower case letter) which indicates gamaka subtype is placed in the column immediately to the right. The subtypes are variants of the basic 'shape.'

The five columns to the right provide cells for displaying ornaments involving different numbers of tone occurrences. To conserve space, all gamakas with five or more tone occurrences are placed in the same cells; for those with more than five tones the number of tones is

Figure 3.1

Gamaka Types and Symbols



Type (Sub- & Grand Totals)
Subtype
Number of Tones

		1 - t	2 - t	3 - t	4 - t	5 - t to n - t	Total
A	a		1		2	3 6-t 4 10-t 5 12-t 6 14-t	6
	b			1		2 7-t	2
	c			1	2	3 6-t 4 8-t	4
	d					1 7-t 2 10-t 3 13-t	3
	e					1 6-t	1
	f			1			1
S.T.		0	1	3	2	11 →	17
B	a		1	2		3 10-t	3
	b					1	1
	c				1	2 8-t	2
S.T.		0	1	1	1	3 →	6
C	a		1		2	3 6-t 4 8-t	4
	b				1		1
	c					1 6-t	1
	d					1 7-t	1
	e					1 13-t	1
	f			1		2 3 7-t	3
	g				1	2 6-t	2
	h			1	2		2
S.T.		0	1	2	4	8 →	25
D	a		1		2		2
	b			1		2	2
	c					1 8-t	1
	d					1 8-t	1
	e					1 13-t	1
	f					1 6-t 2 9-t 3 12-t 4 15-t	4
	g				1		1
	h					1 2 8-t 3 17-t	3
	i				1		1
	j				1		1
S.T.		0	1	1	4	11 →	17
E		•					1
F		—					1
S.T.		2	0	0	0	0	2
G							1
H							1
I							1
S.T.		0	3	0	0	0	3
G.T.		2	7	7	11	33 →	60

shown directly above the symbol. Accents involve only one tone. Stylistics and the first variety of gamaka subtypes involve two tones. Other varieties involve from three to 17 tone occurrences.

The third digit (numeral) of the gamaka code is placed towards the left in the cell of the appropriate number of tone occurrences and the symbol to its right. In the column on the far right is shown the total number of varieties of each gamaka subtype. Subtotals according to the number of tones involved are shown below the display of each gamaka type.

A pair of graphic symbols is presented for each gamaka. The symbol on the left is a 'drawing' of the shape of movement with a circle indicating the pitch level of the principal tone. This kind of symbol was helpful in organizing the many subtypes and varieties into a consistent system based on shape. On the right is the symbol as it appears in the transcriptions. In this simpler form, some symbols (e.g. Aal and Bal) look alike, however the missing information on relationship of pitch movement to principal tone is conveyed in the transcriptions by placement above or below the melodic line (e.g. Aal above, Bal below). In the left column of Figure 3.1 the placement on the graphic transcription of each ornament is shown. Each capital letter is placed above or below a short line representing a segment of the melodic line (e.g. $\underline{\text{ A }}$ shows that all type-A gamakas are placed above the melodic line, and $\overline{\text{ B }}$ that all type-B gamakas are placed below the line).

Ornament Shapes

Type-A gamaka has six subtypes and a total of 17 varieties. Aa has six varieties, Ab has two, Ac has four, Ad has three, Ae has one, and Af has one.

Type-B gamaka has three subtypes and a total of six varieties. Ba has three varieties, Bb has one, and Bc has two.

Type-C gamaka has eight subtypes and a total of 15 varieties. Ca has four varieties, Cb has one, Cc has one, Cd has one, Ce has one, Cf has three, Cg has two, and Ch has two.

Type-D gamaka has ten subtypes and a total of 17 varieties. Da has two varieties, Db has two, Dc has one, Dd has one, De has one, Df has four, Dg has one, Dh has three, Di has one, and Dj has one.

Accents are of two types: E and F.

Stylistics are of three types: G, H, and I.

The shapes of the 60 ornaments classified in this corpus are presented in detail below. The display includes the code designation of the gamaka type, subtype, and variety; the number of pitches involved; the number of tone occurrences (if this were a written tradition this might be described as the number of 'notes'); the interval relationships; and an example of the preceding from the corpus. For example, a variety of a gamaka subtype with two pitches, two tone occurrences, interval relationship in some instances as a 2nd and in other instances as a 3rd with the shape of Ga Ri on the tone Ri will be shown as:

Xxn: 2: 2: 2nd, 3rd: $\overset{\text{GR}}{\text{R}\_}$, $\overset{\text{MR}}{\text{R}\_}$.

A variety of a gamaka subtype with three pitches, eight tone occurrences,

interval relationships of a 4th followed by three cycles of a 2nd will be shown as:

PRGRGRGR
Xxn: 3: 8: 4th and 2nd (x3): R________.

The holding of a tone within a gamaka is given an extra count in tone occurrence to indicate the longer duration as compared to the other tones of the gamaka. Therefore Ma, Ri_, Ma, Ri_, Ma, Ri_, Ma on the tone Ri, even though there are actually seven tone occurrences, will be counted as ten tone occurrences as follows:

MR_MR_MR_M
Xxn: 2: 10: 2nd (x3): R__________.

The full inventory of 60 ornaments in the corpus of this study is shown below. Aa slides from a higher tone to the principal tone. Aa2 through Aa6 are extensions of Aa1.

RS MR RD PS NR
Aa1: 2: 2: 2nd, 3rd, 4th, 5th, 6th: S_, R_, D_, S_, R_.

GRGR SDSD
Aa2: 2: 4: 2nd (x2), 3rd (x2): R___, D___.

NDNDND SDSDSD
Aa3: 2: 6: 2nd (x3), 3rd (x3): D_____, D_____.

NDNDNDNDND
Aa4: 2: 10: 2 (x5): D__________.

NDNDNDNDNDND
Aa5: 2: 12: 2 (x6): D____________.

MGMGMGMGMGMGMG
Aa6: 2: 14: 2 (x7): M______________.

Ab slides from a higher tone to the principal tone. At the end the principal tone moves up suggesting the adjacent tone. Ab2 is an extension of Ab1.

MRM SDN PRM
Ab1: 3: 3: 3rd, 3rd and 2nd, 4th and 3rd: R__, D__, R__.

NDNDNDN
Ab2: 2: 7: 2nd (x4): D_______.

Ac is similar to Ab1 except that the final tone is fully formed. Ac2, Ac3, and Ac4 are extensions of Ac1.

GSR
Ac1: 3: 3: 3rd and 2nd: R__.

DMPM
Ac2: 3: 4: 3rd and 2nd: M___.

RNSNSN
Ac3: 3: 6: 3rd and 2nd (x2): N_____.

PRGRGRGR
Ac4: 3: 8: 4th and 2nd (x4): R_______.

Ad slides from a higher tone to the principal tone, the latter is held. Because of the way the longer duration is perceived, the holding is counted as a tone occurrence. At the end the principal tone moves up suggesting the adjacent tone. Ad2 and Ad3 are extensions of Ad1 (which itself has internal repetition).

MR_MR_M
Ad1: 2: 7: 3rd (x2): R_______.

MR_MR_MR_M
Ad2: 2: 10: 3rd (x3): R__________.

MR_MR_MR_MR_M
Ad3: 2: 13: 3rd (x4): R_____________.

Ae is similar to Ad in shape except that the principal tone does not move up at the end.

MR_MR_
Ae1: 2: 6: 3rd (x2): R______.

Af moves from a higher tone to the principal tone. The principal tone is repeated with articulation. Af moves from a higher tone to the

principal tone. The principal tone is repeated with articulation. Af1 appears with groups of two pitches, three tones. The initial is a step above the final and is significant. The initial receives no gamaka but is included in the graphic and solfège representation to differentiate this important grouping from accent.

RSS
Af1: 2: 3: 2nd and prime: RS_.

Ba slides down from the principal tone to a lower tone. Ba2 is an extension of Ba1 with return to principal tone. Ba3 is an extension of Ba2.

SN GS
Ba1: 2: 2: 2nd, 3rd: S_, G_.

SNS NPN NMN
Ba2: 2: 3: 2nd, 3rd, 4th: S__, N__, N__.

MGMGMGMGMG
Ba3: 2: 10: 2nd (x5): M_________.

Bb is similar to Ba except that the final tone is only suggested.

NPNPN
Bb1: 2: 5: 3rd (x2): N____.

Bc starts on the principal tone, holds it, then moves to a lower tone and returns to the principal tone. Bc2 is an extension of Bc1 with oscillations in even rhythm.

N_PN
Bc1: 2: 4: 3rd: N___.

N_PNPNPN
Bc2: 2: 8: 3rd (x3): N_______.

Ca slides from a lower tone to the principal tone. Ca2, Ca3, and Ca4 are extensions of Ca1.

Ca1: 2: 2: 2nd, 3rd, 4th, 5th, 6th: $\overset{\text{NS}}{\text{S}\_}$, $\overset{\text{NR}}{\text{R}\_}$, $\overset{\text{SM}}{\text{M}\_}$, $\overset{\text{PR}}{\text{R}\_}$, $\overset{\text{PG}}{\text{G}\_}$.

Ca2: 2: 4: 2nd (x2), 3rd (x2): $\overset{\text{GMGM}}{\text{M}\underline{\quad}}$, $\overset{\text{PNPN}}{\text{N}\underline{\quad}}$.

Ca3: 2: 6: 2nd (x3), 3rd (x3): $\overset{\text{GMGMGM}}{\text{M}\underline{\qquad}}$, $\overset{\text{PNPNPN}}{\text{N}\underline{\qquad}}$.

Ca4: 2: 8: 2nd (x4): $\overset{\text{GMGMGMGM}}{\text{M}\underline{\qquad\quad}}$.

Cb is similar to Ca2 except that the initial interval is larger than the other intervals.

Cb1: 3: 4: 4th and 3rd: $\overset{\text{MNPN}}{\text{N}\underline{\quad}}$.

Cc is similar to Cb1 except that the final tone is only suggested.

Cc1: 3: 6: 4th and 2nd (x3): $\overset{\text{DRSRSR}}{\text{R}\underline{\qquad}}$.

Cd is similar to Cc1 except that the final tone does not move up but is held.

Cd1: 3: 7: 4th and 2nd (x3): $\overset{\text{DRSRSR\_}}{\text{R}\underline{\qquad\ }}$.

Ce slides up to the principal tone, moves to a lower tone, and holds it. The pattern is repeated except for the last unit in which the lower tone is not held.

Ce1: 2: 13: 2nd (x4): $\overset{\text{SRS\_RS\_RSR}}{\text{R}\underline{\qquad\qquad}}$.

Cf starts from a lower tone, moves to a higher tone and then to the principal tone. The initial interval is larger than the other intervals. Cf2 and Cf3 are extensions of Cf1.

Cf1: 3: 3: 3rd and 2nd, 4th and 3rd, 4th and 2nd: $\overset{\text{SGR}}{\text{R}\underline{\ \ }}$, $\overset{\text{PSD}}{\text{D}\underline{\ \ }}$, $\overset{\text{PSN}}{\text{N}\underline{\ \ }}$.

SGRGR PSNSN
Cf2: 3: 5: 3rd and 2nd (x2), 4th and 2nd (x2): R____, N____.

SGRGRGR
Cf3: 3: 7: 3rd and 2nd (x3): R______.

Cg is similar to Cf1 except that the initial tone is held.

PPND
Cg1: 3: 4: prime and 3rd and 2nd: D___.

PPNDND
Cg2: 3: 6: prime and 3rd and 2nd (x2); D_____.

Ch slides from a lower tone to the principal tone which is articulated. Ch2 is an extension of Ch1.

Ch1: 2: 3: 2nd and prime, 3rd and prime, 4th and prime, 5th and prime, 6th and prime, octave and prime:

RGG RMM DRR PRR SDD PMM GGG
G__, M__, R__, R__, D__, M__, G__.

PNNN
Ch2: 2: 4: 3rd and prime (x3): N___.

Da starts on the principal tone and moves to a higher tone. Da2 is an extension of Da1.

GM PN
Da1: 2: 2: 2nd, 3rd: M_, N_.

MPMP
Da2: 2: 4: 2nd (x2): M___.

Db slides up from the principal tone to a higher tone and slides down to the principal tone. Db2 is an extension of Db1.

RGR DSD
Db1: 2: 3: 2nd, 3rd: R__, D__.

GMGMG PSDSD
Db2: 2: 5: 2nd (x2), 4th and 3rd (x2): M____, D____.

Dc is similar to Db2 except that the principal tone is held at the end of the first unit.

RMR_MRMR
Dc1: 2: 8: 3rd (x3): R________.

Dd is similar to Dc1 except that the initial tone is held and the final tone is only suggested.

R_MR_MRM
Dd1: 2: 8: 3rd (x3): R________.

De is similar to Dd1 except that the initial tone is not held.

DND_DND_DND_DNDN
De1: 2: 16: 2nd (x5): D________________.

Df is similar to Dd1 except that the principal tones are held.

R_MR_M
Df1: 2: 6: 3rd (x2): R______.

R_MR_MR_M
Df2: 2: 9: 3rd (x3): R_________.

R_MR_MR_MR_M
Df3: 2: 12: 3rd (x4): R____________.

R_MR_MR_MR_MR_M
Df4: 2: 15: 3rd (x5): R_______________.

Dg is similar to Db1 except that the final tone is held.

RMR_
Dg1: 2: 4: 3rd: R___.

Dh is similar to Dg1 except that the initial principal tone is held.

D_ND_ R_MR_
Dh1: 2: 5: 2nd and 3rd: D_____, R_____.

R_MR_MR_
Dh2: 2: 8: 3rd (x2): R________.

R_MR_MR_MR_MR_MR_
Dh3: 2: 17: 3rd (x5): R_________________.

Di is similar to Dh1 except that the ending tone is not held.

R_MR
Di1: 2: 4: 3rd: R___.

Dj moves from the principal tone to an adjacent tone which is held, and returns to the principal tone.

MP_M
Dj1: 2: 4: 2nd: M___.

Accent-E involves a glottal stop of the voice.

E: 1: 1: on S, R, G, M, P, D, N.

Accent-F involves an articulation on a tone.

F: 1: 1: on S, R, G, M, P, D, N.

Stylistic-G is related to Aa1 in shape (and placement on the transcription). It differs in that it is a fast connecting tone. It is an important element and is clearly audible at half speed.

RS MR SP
G: 2: 2: 2nd, 3rd, 4th: S_, R_, P_.

Stylistic-H is related to Ca1 in shape (and placement on the transcription) but is a fast connecting tone.

NS NR DR SP
H: 2: 2: 2nd, 3rd, 4th, 5th: S_, R_, R_, P_.

Stylistic-I is related to Ba1.

RS
I: 2: 2: 2nd: S_.

Summary

There are 17 kinds each of type-A and type-D gamaka, 15 kinds of type-C, and six kinds of type-B which appear in the nine performances of three rāgas in this study. The varieties of gamaka of types A, B, and D in this classification appear as extensions of four-tone gamakas, in that they have the same characteristic unit shape but more oscillations. These differ from one performer to another according to the

performer's style. Type-C gamaka has more subtypes, with different characteristic shapes than types A or D.

It has been noticed while transcribing the pitches for the gamakas in solfège, that in certain gamakas, although oscillating or sliding to a higher pitch, the tones are sometimes slightly lower or higher than the initial pitch rather than exactly the same. This aspect is part of a rāga, is expected in the Karnatic tradition, and is learned by the performer in the training process. However, such microtonal differences are beyond the level of specificity of this study and are suggested as a focus for future study.

CHAPTER IV

GAMAKAS IN RĀGA I: SHANKARĀBHARANA

The outline of this chapter and the two that follow it is in each case to present first some general information on the rāga and then three performances of ālāpana on the rāga. The general information includes a verbal statement and figures showing the tones with some characteristic gamakas in the ascent and descent of the scale in Indian solfège, Western staff notation, and graph. In the graph, the scalar outline is displayed first in proportionate interval size (i.e., a whole step twice as large as a half step), and then by scale step (each scale step the same size whether comprised of one, two, or three half-steps) as in the ālāpana transcriptions.

The presentation of each performance includes information on the recorded source, the specific gamakas with the interval sizes on each tone (i.e., scale step), the transcription, three tables of data derived from the transcription, and discussion of the data in the tables. The tables show the percentage distribution of tones and gamakas, joint distribution of tones and gamakas, and distribution of held tones. The analysis is quantitative and statistical.

To minimize confusion in the analysis in Chapters IV through IX where the context might not make the meaning clear, the word 'gamaka' will be reserved for ornamentation involving prominent use of two or more pitches; the word 'ornament' will be used to refer to the broad concept of gamaka (i.e., collectively to the restricted meaning of gamaka plus what this writer designates as 'accent' and 'stylistic').

In the first table for each performance in Chapters IV, V, and VI, the numerals in parentheses indicate frequency of occurrences; the numerals without parentheses indicate percentages to the closest whole percent. (Where the sum of rounded off percentages constitutes the total data but does not add exactly to 100%, the total is shown as 100% with an asterisk to indicate this condition.) For example, Table 4.1 shows that in Rāga I, Performer 1, a total of (793) tones were sung. Of these, (122) were Sa, (131) were Ri, and so on through the scale. Starting from the column on the left, the table shows that of the occurrences of Sa, (25) or 20% had a gamaka, (2) or 2% had an accent, (29) or 24% had a stylistic; and none had a double ornament. The next two columns show that of the occurrences of Sa, (56) or 46% had some kind of ornament, and (66) or 54% had no ornament of any kind. The table shows the comparable information for each tone in the rāga, and on the bottom line, for the total of all tones.

The second table for each performance in Chapters IV, V, and VI shows the joint distribution of tones and gamakas. It is called a joint distribution because each tone is jointly classified as to name of tone (Sa, Ri, etc.) and type of ornament (Aa1, Aa2, etc.). Of the total inventory of ornaments in the corpus, only those (including double ornaments) that occur at least once in that performance are listed in the table. The numerals are of frequency of occurrence, except those in the column on the far right that are the sum of each ornament type expressed as a percentage of all ornamented tones in the performance. For example, Table 4.2 shows that in Rāga I, Performance 1 there are 154 occurrences of gamaka type Aa1, of which 12 are on Sa, 68 on Ri, 8 on Ga, and so on

through the scale. These 154 gamaka type Aal comprise 26% of all ornamented tones in this performance.

The third table for each performance in Chapters IV, V, and VI shows distribution of held tones. In this study, tones whose duration is one second or longer are designated 'held' tones. Although holding a tone is not ornamentation, the long duration in comparison to others gives it special prominence, so that its treatment--whether ornamented or not--contributes greatly to the total impression of the rāga being performed. In considering held tones, range (register) is important, so the table displays occurrences of held tones in relation to low range (below middle Sa), middle range (middle Sa through middle Ni), and high range (high Sa and above). In Table 4.3 it can be seen that of the 793 tones, (28) or 4% are held tones. Of these, none are in low range (in this performance low Pa through low Ni); 11 unornamented and 2 ornamented in middle range; and 11 unornamented and 4 ornamented in high range (in this performance high Sa through high Pa).

Rāga Shankarābharana

The formal name of this rāga, number 29 in the 72-melakarta system, is Dhīra Shankarābharana. It is popularly known as Shankarābharana. This rāga is believed to be among the oldest of existing rāgas and several important compositions are in it. It is traditionally considered an evening rāga, but in contemporary practice it is sung at any time of day. Shankarābharana is regarded as having a special capacity for evoking multiple moods (rasas). It possesses a wide scope for elaboration of ālāpana.

Shankarābharana is a sampūrna rāga--all seven tones are present in both ascent and descent. Within the Karnatic tradition, it is a generally held belief that all the tones in the scale are capable of taking some kind of gamaka. The tonal inventory is: Shadja (Sa), Chatuśruti Rishabha (Ri_2), Antara Gāndhāra (Ga_2), Suddha Madhyama (Ma_1), Panchama (Pa), Chatuśruti Dhaivata (Da_2), and Kākili Nishādha (Ni_2).

Figure 4.1

Rāga I: Shankarābharana in
Solfège and Staff Notation

Sa Ri$_2$ Ga$_2$ Ma$_1$ Pa Da$_2$ Ni$_2$ Sa

Sa Ni$_2$ Da$_2$ Pa Ma$_1$ Ga$_2$ Ri$_2$ Sa

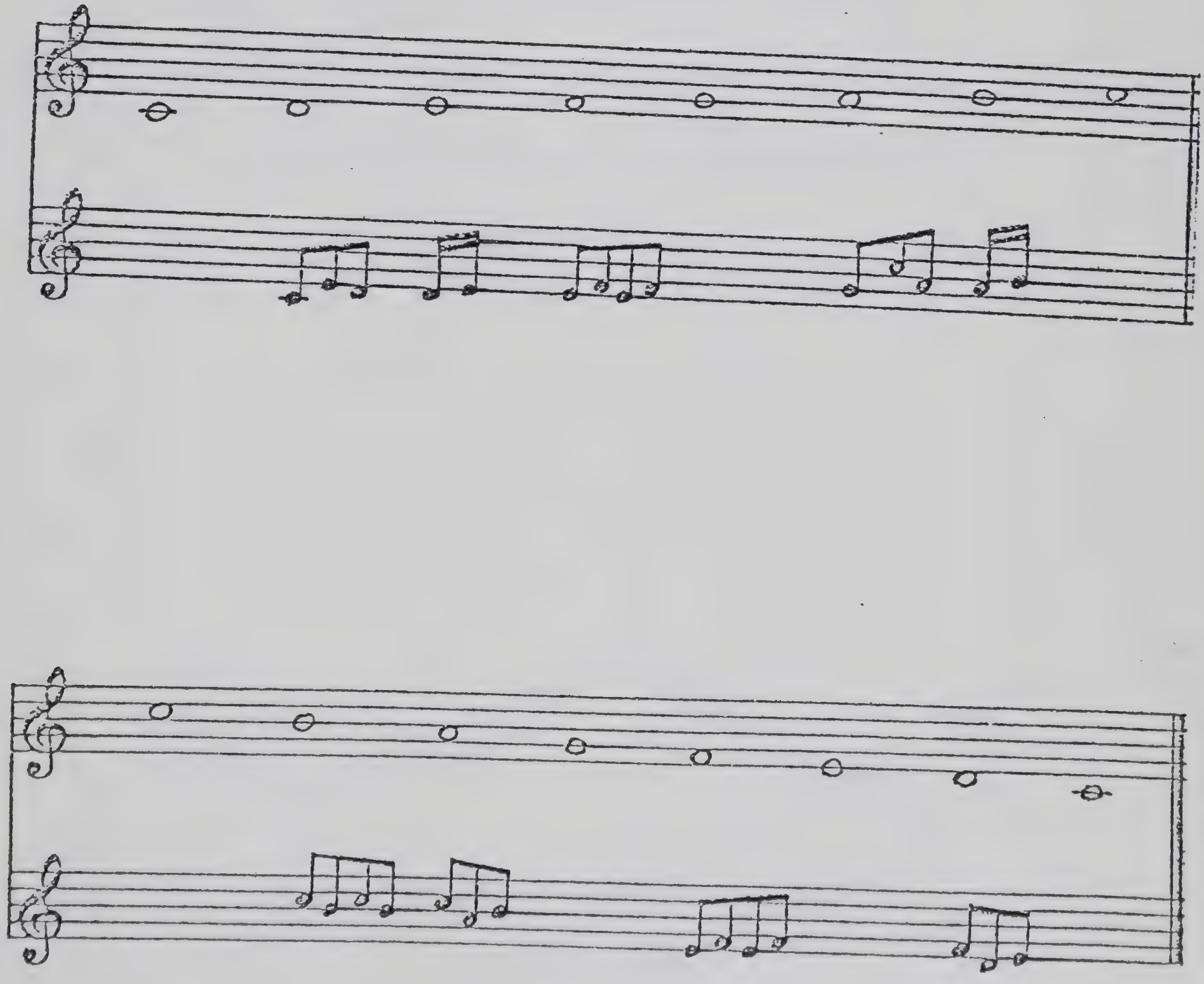
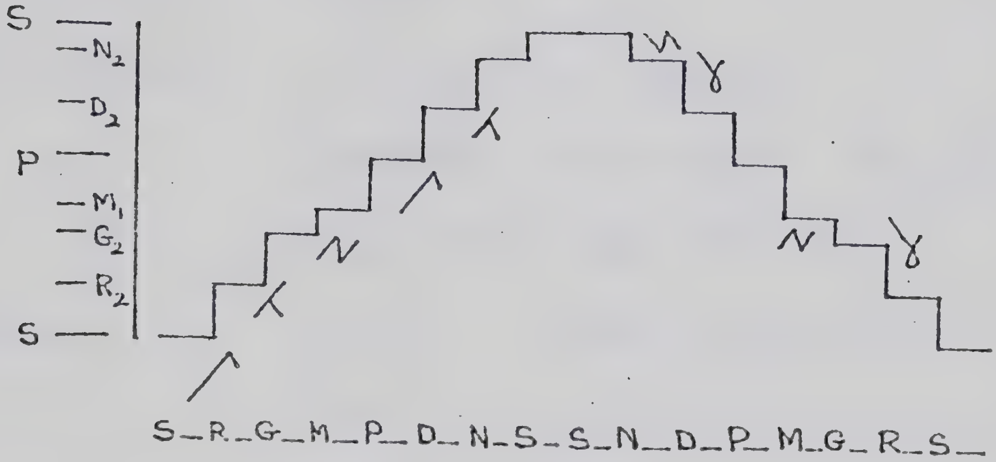
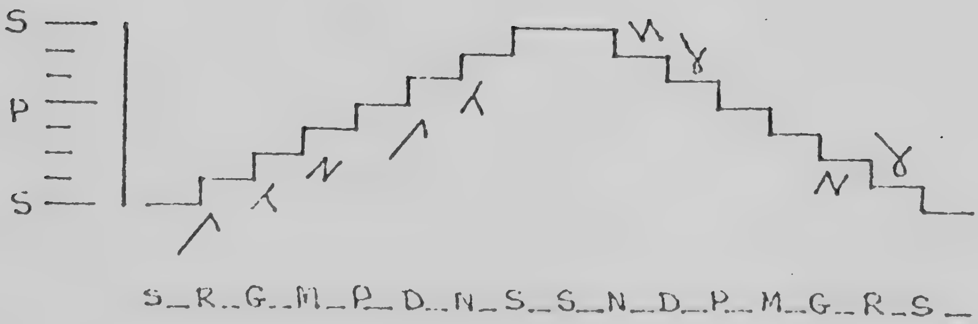


Figure 4.2

Rāga I: Shankarābharana in Graph


S
N₂
D₂
P
M₁
G₂
R₂
S
S_R_G_M_P_D_N_S_S_N_D_P_M_G_R_S_

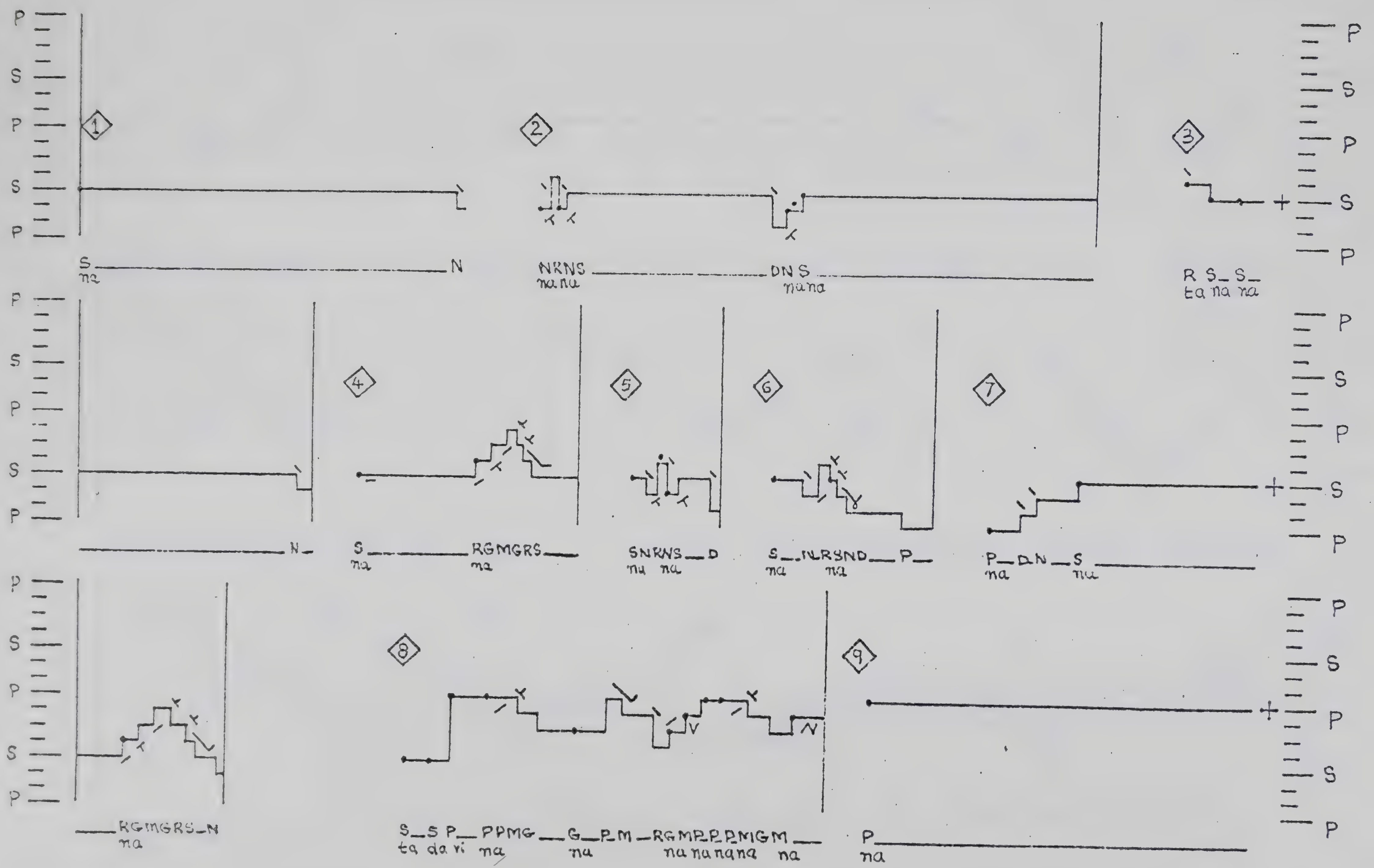
By Interval Size

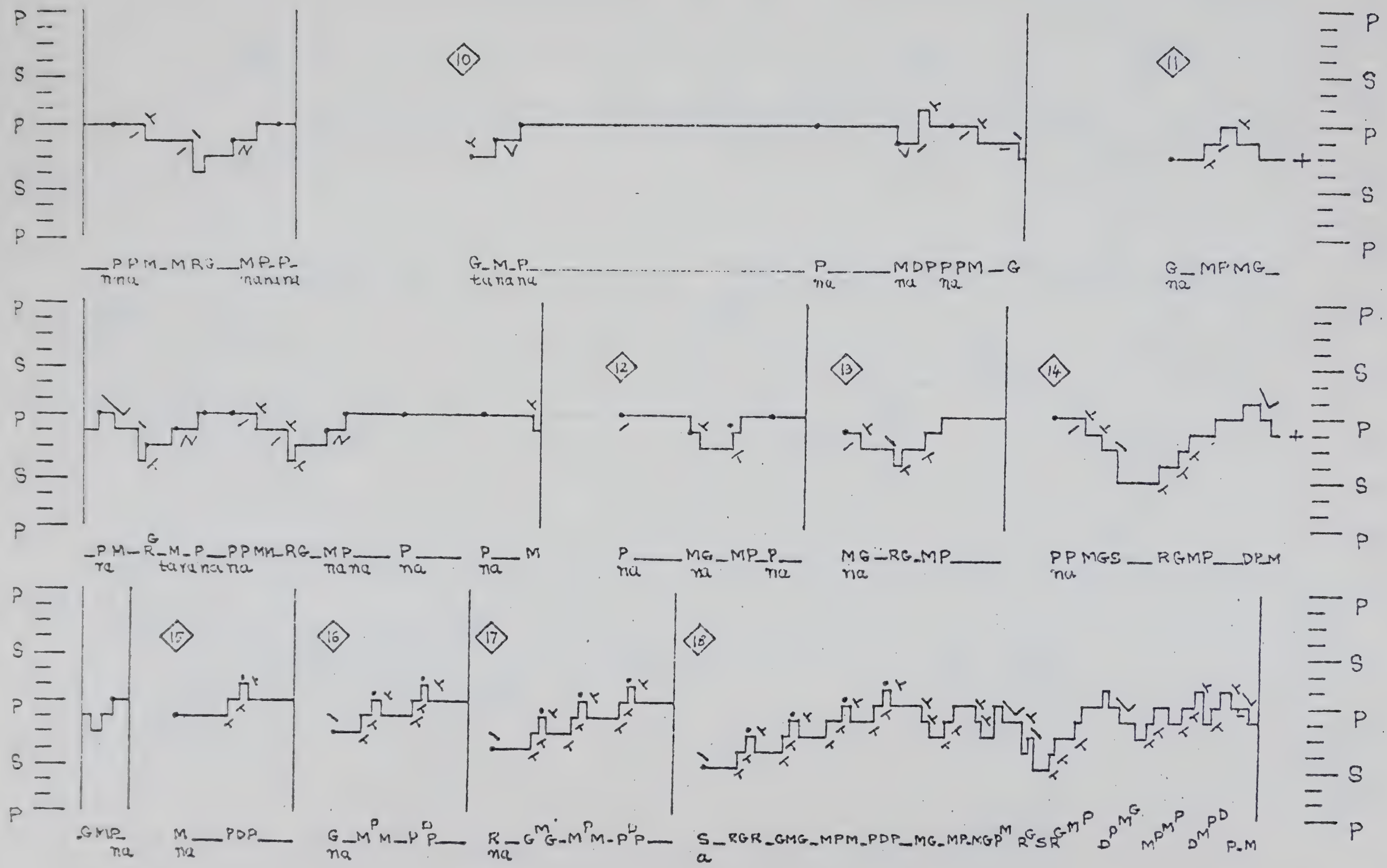

S
P
S
S_R_G_M_P_D_N_S_S_N_D_P_M_G_R_S_

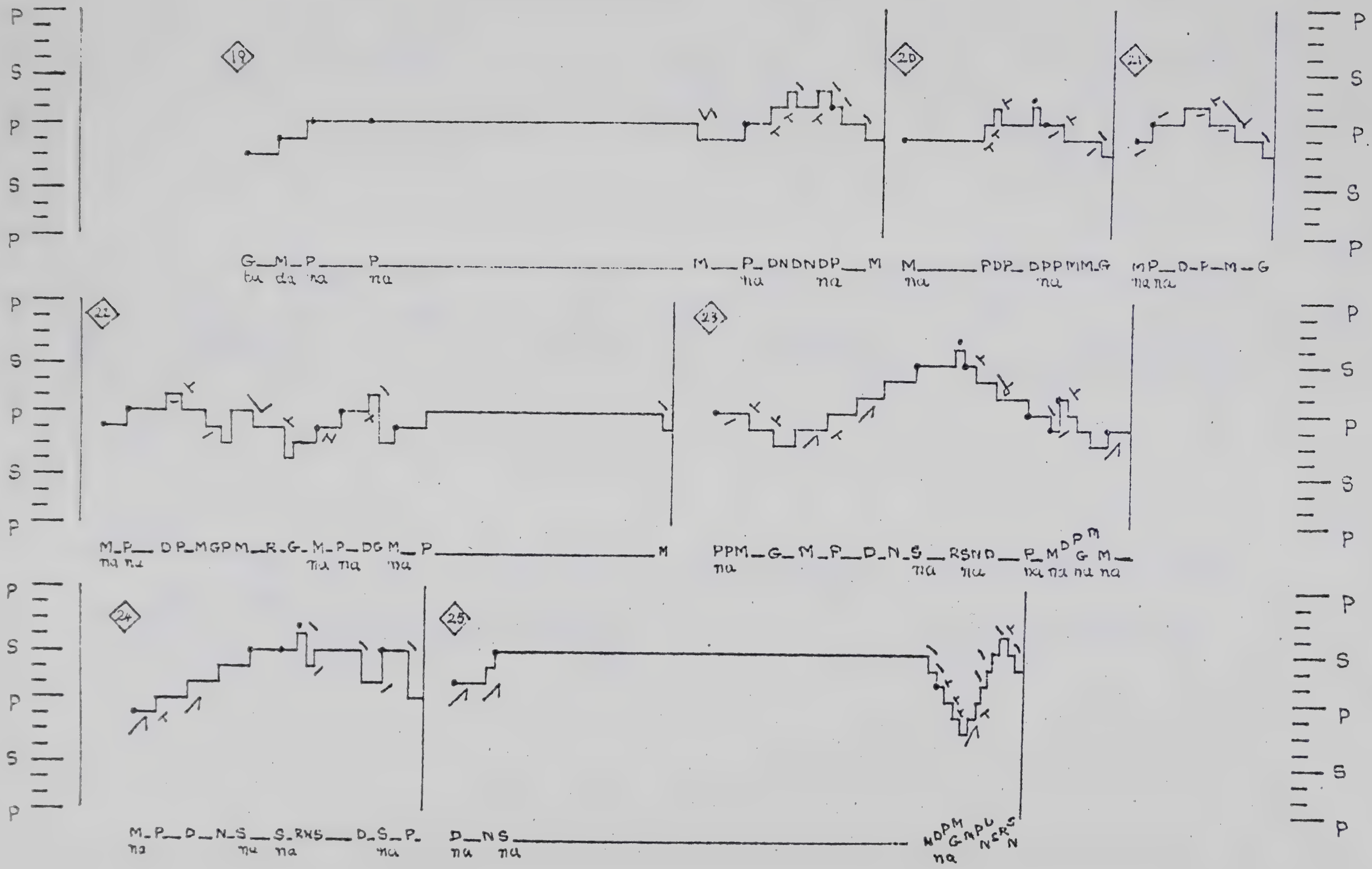
By Scale Step

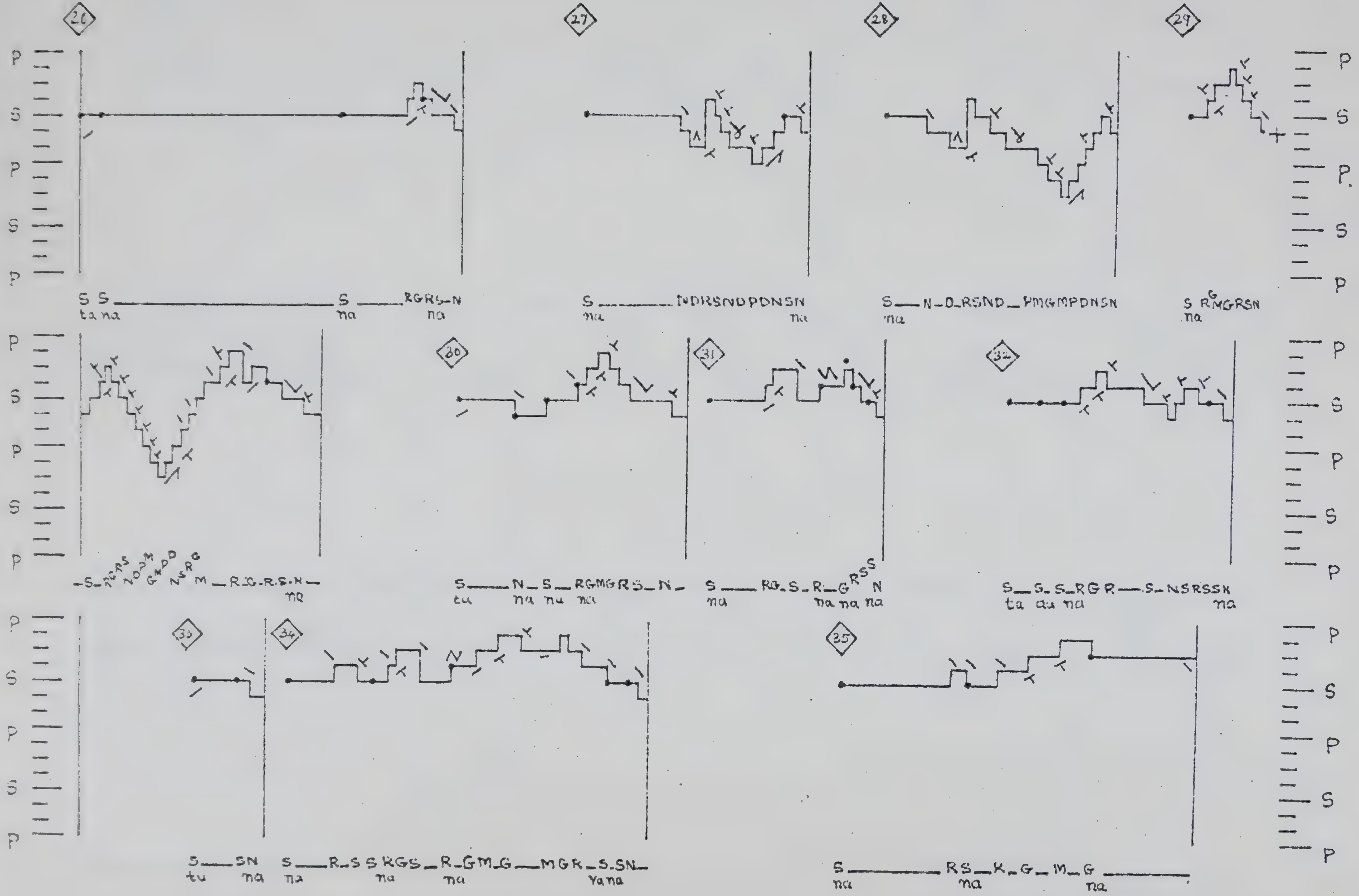
Rāga I, Performer 1

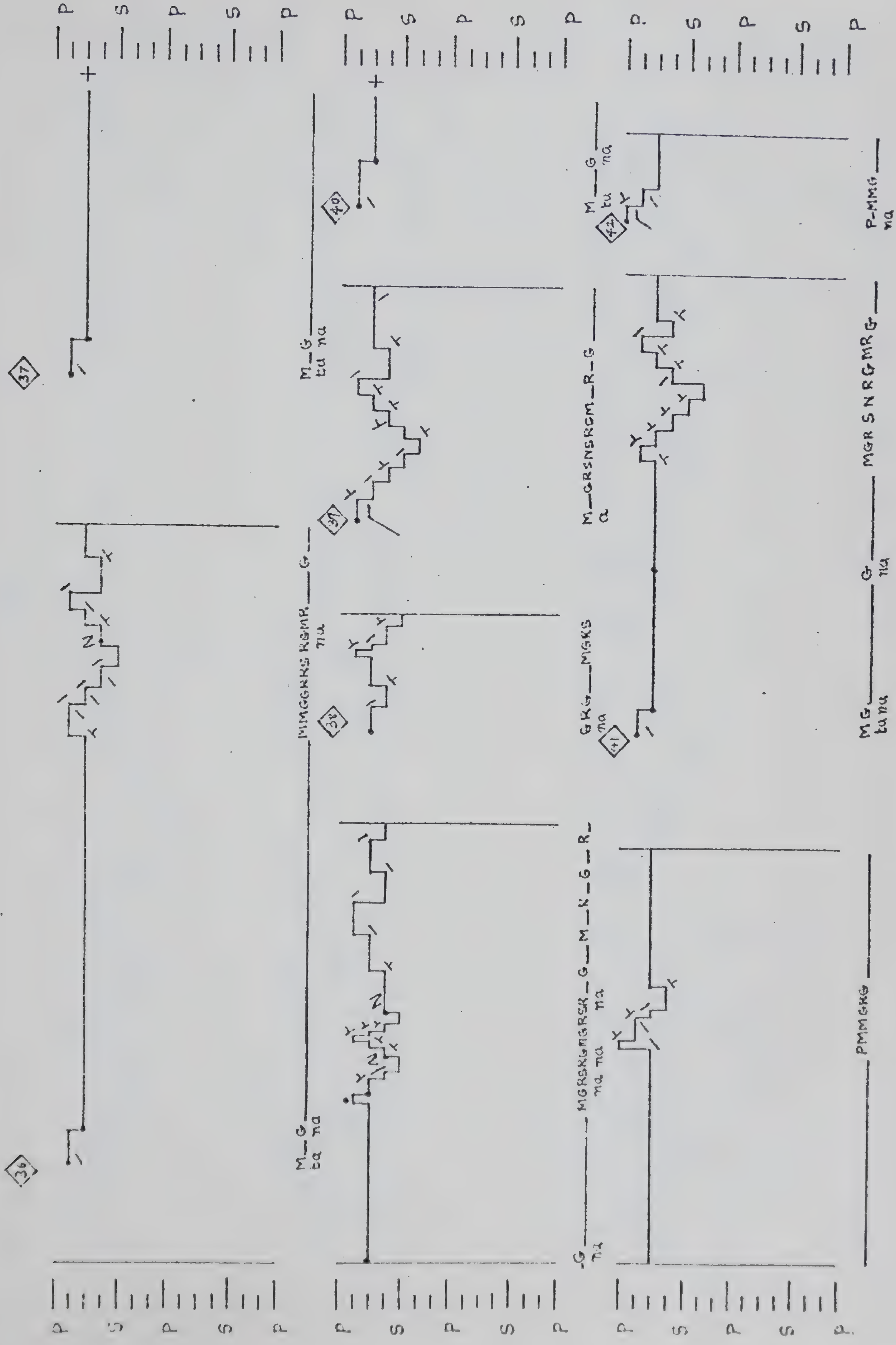
Principal Melody:	Female Singer	
Performer:	M. S. Subbulakshmi	
Melodic Accompaniment:	Violin	
Drone Accompaniment:	Tambūra	
Performance Duration:	5 minutes, 3.3 seconds	
Disc:	CLASSICAL INDIAN MUSIC. Parlophone PMAE 501.	
	Reissued on Odeon MOAE 147	
Extract From:	Kriti:	"SAROJA DALA NETRI"
	Rāga:	Shankarābharana
	Tāla:	Ādi
	Language:	Telugu
	Composer:	Syama Shastri

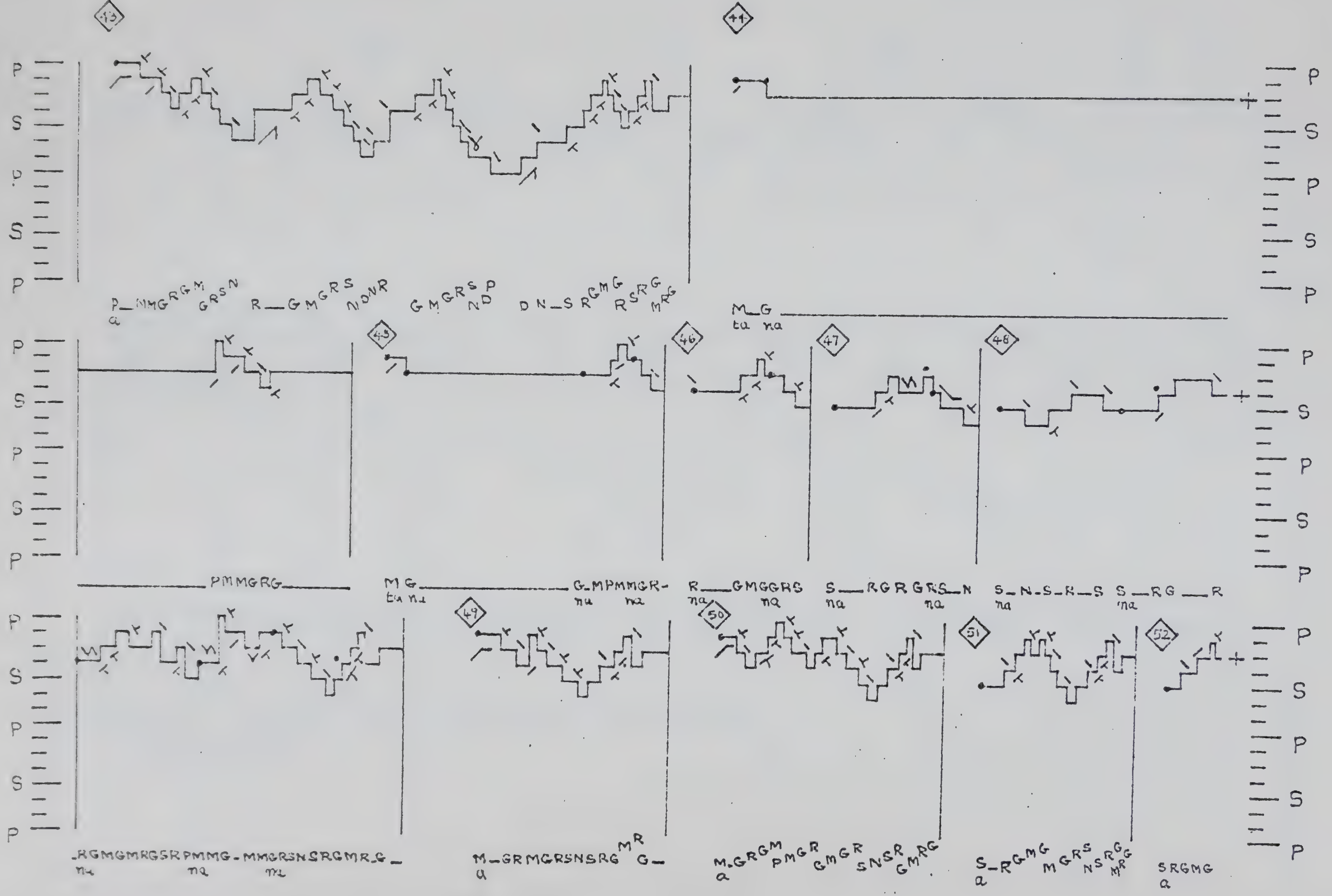

P S P S P
①
S na —— N
②
NKNS na na —— DNS na na
③
R S_ S_ ta na na
④
—— N
S na —— RGMGRS na
⑤
SNKNS na na — D
⑥
S_ NLRSND na na — P
⑦
P_ DN_ S na na
⑧
—— RGMGRS_N na
S_ S P_ PPMG — G_ P_M — RGMPPPMGM — ta da ri na na na na na na na
⑨
P na

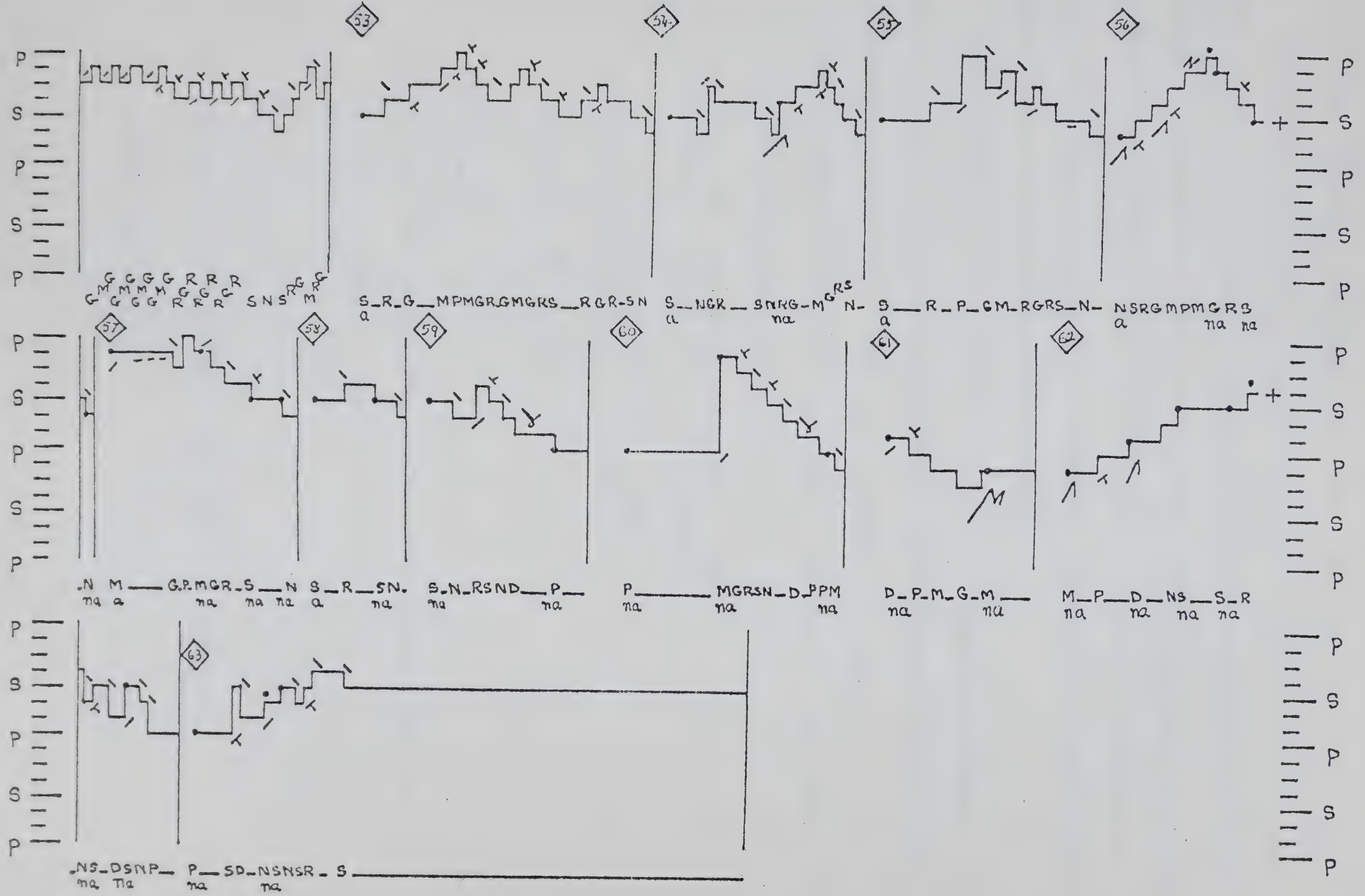

P
S
P
S
P
10
11
__PPM_MRG__MP-P-
nna
nanana
G_M_P_
tunana
P___
na
MDPPPM_G
na
na
G__MPMG_
na
12
13
14
_PM_R_M_P__PPMM_RG_MP___ P___ P___M
G
re
taranana
nana
na
na
P___MG_MP_P__
na
na
na
MG_RG_MP___
na
PPMGS__RGMP__DPM
na
15
16
17
18
GMP
na
M___PDP___
na
G_M^P M_P^D P___
na
R_G^M G_M^P M_P^D P___
na
S_RGR_GMG_MPM_PDP_MG_MP.MGP^M R^G SR^G M^P D^P M^G M^P M^P D^M P^D P_M
a


19
20
21
22
23
24
25
P
S
P
S
P
G_M_P_____P_______________________M__P_DNDNDP__M
tu da na na na na
M______PDP_DPPMMG
na na
mP__D-P-M-G
na na
M_P__DP_MGPM_R_G_M_P_DG M_ P______________M
na na na na na
PPM_G_M_P__D_N_S__RSND__P_M D P M G M_
na na na na na na na
M_P__D_N_S__S_RNS___D_S_P_
na na na na
D__NS__________________N D P M G N P U N E R S N
na na na


26
27
28
29
P
S
P
S
P
S S ——— S ——— RGRS—N
ta na na na
S ——— NDRSNDPDNSN
na na
S—N–D–RSND—PMGMPDNSN
na
S R^G MGRSN
na
30
31
32
–S–R^GR^S N^D P^M G^M P^D N^S R^G M—R.G.R.S.N—
na
S——N—S—RGMGRS—N–
tu na nu na
S——RG–S–R—G R^S S N
na na na na
S—S–S—RGR——S–NSRSSN
ta au na na
33
34
35
S——SN
tu na
S——R–S S RGS—R—GM—G——MGR—S.SN—
na na na Yana
S————RS—K—G—M—G————
na na na


P
S
P
S
P
36
37
38
39
40
41
42
M_G
ta na
M_G
tu na
-G
na
PMMGRG
MG
ta na
G
na
MGRSNRGMRG
P-MMG
na
M_G
tu na


43
44
45
46
47
48
49
50
51
52
P
S
P
S
P
P—NMGRGM GRSN R—GMGRS NDNR GMGRSP ND DN—SRGMG RSRG MRG
a
M—G
ta na
PMMGRG
MG
ta na
G—MPMMGR—
na na
R—GMGGRS
na na
S—RGRGRS—N
na na
S—N—S—R—S S—RG—R
na na
-RGMGMRGSRPMMG-MMGRSNSRGMR-G—
na na na
M—GRMGRSNSRG MR G—
a
M.GRGM PMGR GMGR SNSR GMRG
a
S—RGMG MGRS NSRG MRG
a
SRGMG
a


53
54
55
56
57
58
59
60
61
62
63
P
S
P
S
P
+
GMGMGMGMG GRGRGRGR SNS RGMRG
S_R_G__MPMGRGMGRS__RGR-SN
a
S__NGR__SNRG-M GRS N-
a na
S__R_P_GM_RGRS_N-
a
NSRGMPMGRS
a na na
.N M
na a
G.P.MGR_S__N
na na na
S_R__SN.
a na
S_N_RSND__P__
na na
P________MGRSN_D_PPM
na na na
D_P_M_G_M____
na na
M_P__D_NS__S_R
na na na na
.NS_DSNP__
na na
P__SD_NSNSR_S
na na

Performance: Rāga I, Performer 1

The total duration of the performance as it appears on the transcription is 308.6 seconds, of which the soloist occupies 254.4 seconds. Silence in the soloist's part, during which the accompaniment continues, occupies 54.2 seconds. There are 63 phrases in total. The range of this performance is from low Pa to high Pa (two octaves). This performance starts on middle Sa and ends on high Sa.

The performer, M. S. Subbulakshmi, uses 18 types of ornaments, including gamakas, accents and stylistics, and some double ornaments (i.e., two gamakas on one tone). Four type-A gamakas are used.

Aa1 is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

2nd on $\overset{RS}{S\_}$, $\overset{GR}{R\_}$, $\overset{MG}{G\_}$, $\overset{PM}{M\_}$, $\overset{DN}{P\_}$, $\overset{ND}{D\_}$, and $\overset{SN}{N\_}$;

3rd on $\overset{GS}{S\_}$, $\overset{MR}{R\_}$, $\overset{PG}{G\_}$, $\overset{DM}{M\_}$, $\overset{NP}{P\_}$, and $\overset{SD}{D\_}$;

4th on $\overset{PR}{R\_}$, $\overset{DG}{G\_}$, and $\overset{SP}{P\_}$;

5th on $\overset{PS}{S\_}$.

Aa2 is used on tones Ri, Ma, and Da. The interval size is:

2nd (x2) on $\overset{GRGR}{R\_\_\_}$ and $\overset{NDND}{D\_\_\_}$;

3rd (x2) on $\overset{PGPG}{M\_\_\_}$.

Ab1 is used on tone Da only. The interval size is:

3rd and 2nd on $\overset{SDN}{D\_\_}$.

Af1 is used on tones Sa, Ma, and Pa. The interval size is:

2nd and prime on $\overset{\text{RSS}}{\text{RS\_}}$, $\overset{\text{PMM}}{\text{PM\_}}$, and $\overset{\text{DPP}}{\text{DP\_}}$.

Two type-B gamakas are used.

Ba1 is used on tone Ga only. The interval size is:

2nd on $\overset{\text{GR}}{\text{G\_}}$;

3rd on $\overset{\text{GS}}{\text{G\_}}$.

Ba2 is used on tone Ma only. The interval size is:

2nd on $\overset{\text{MGM}}{\text{M\_\_}}$.

Five type-C gamakas are used.

Ca1 is used on six tones Sa, Ri, Ga, Ma, Pa, and Da. The interval size is:

2nd on $\overset{\text{NS}}{\text{S\_}}$, $\overset{\text{SR}}{\text{R\_}}$, $\overset{\text{RG}}{\text{G\_}}$, $\overset{\text{GM}}{\text{M\_}}$, and $\overset{\text{MP}}{\text{P\_}}$;

3rd on $\overset{\text{DS}}{\text{S\_}}$, $\overset{\text{NR}}{\text{R\_}}$, $\overset{\text{SG}}{\text{G\_}}$, $\overset{\text{RM}}{\text{M\_}}$, $\overset{\text{GP}}{\text{P\_}}$ and $\overset{\text{MD}}{\text{D\_}}$;

4th on $\overset{\text{PS}}{\text{S\_}}$, $\overset{\text{DR}}{\text{R\_}}$, $\overset{\text{SM}}{\text{M\_}}$, and $\overset{\text{RP}}{\text{P\_}}$.

Ca2 is used on tone Ma only. The interval size is:

2nd (x2) on $\overset{\text{GMGM}}{\text{M\_\_\_}}$.

Cf1 is used on tones Ri, Ma, Da, and Ni. The interval size is:

3rd and 2nd on $\overset{\text{SGR}}{\text{R\_\_}}$, $\overset{\text{GPM}}{\text{M\_\_}}$, $\overset{\text{PND}}{\text{D\_\_}}$, and $\overset{\text{DSN}}{\text{N\_\_}}$;

4th and 3rd on $\overset{\text{PSD}}{\text{D\_\_}}$;

4th and 2nd on $\overset{\text{PSN}}{\text{N\_\_}}$.

Cf2 is used on tone Ma only. The interval size is:

GPMPM
3rd and 2nd (x2) on M____.

Ch1 is used on tones Ma and Pa. The interval size is:

SMM
4th and prime on M__;

SPP
5th and prime on P__.

Three type-D gamakas are used.

Da1 is used on tones Ga, Ma, Pa, and Da. The interval size is:

GM MP PD DN
2nd on G_, M_, P_, and D_.

Da2 is used on tones Ri and Ma. The interval size is:

SRSR MPMP
2nd (x2) on R___ and M___.

Db1 is used on tone Da only. The interval size is:

DND
2nd on D__.

Accent-E is used on tones Ri, Ga, Ma, Pa, and Da.

Accent-F is used on tones Sa and Da.

Stylistic-G is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

RS GR MG PM DP ND SN
2nd on S_, R_, G_, M_, P_, D_, and N_;

DM
3rd on M_.

Stylistic-H is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

NS SR RG GH MP PD DN
2nd on S_, R_, G_, M_, P_, D_, and N_;

NR
3rd on R_;

DR
4th on R_.

Double ornaments are used on six tones Ri, Ga, Ma, Pa, Da, and Ni.

Table 4.1 shows that a total of 793 tones were used by the performer, of which 74% received some kind of ornaments and 26% had no ornament. Of the 793, 38% were tones with gamaka, 1% were tones with accent, 33% were tones with stylistic, and 2% were tones with double ornament.

The tones Ri and Da are heavily ornamented (92% Ri and 100% Da). The tones Sa and Pa are ornamented approximately half of the time (46% Sa and 54% Pa). The tones Ga, Ma, and Ni are between these two extremes (74% Ga, 84% Ma, and 88% Ni).

In Table 4.2 it can be seen that types Aal, Cal, and stylistics account for a larger proportion of ornaments than any other types (26% Aal, 11.6% Cal, and 44% stylistics). Some tones receive more of a given gamaka than do others. Of the total 154 type Aal, the tones Ri and Ni receive 68 and 46 respectively. Of the total 69 type Cal, the tones Ma and Da receive 27 and 14 respectively. Of the stylistics, tones Ga and Ma receive more than any other tones (91 Ga and 61 Ma).

More varieties of type-A gamakas occur on tones Ma and Da than on other tones; more type-C on tone Ma; type-D is spread thinly over several tones (Ri, Ga, Ma, Pa, and Da); and type-B is used rarely on two tones (Ga and Ma). Accent-E is used on more tones (Ri, Ga, Ma, Pa, and Da) than Accent-F (Sa and Da). Both stylistic-G and stylistic-H are used on all seven tones but stylistic-G is used more than H (142 and 119, respectively). Double ornaments are found on all tones except Sa.

Table 4.1
Percentage Distribution of Tones and Gamakas:
Rāga I, Performer 1

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(25)	20	(2)	2	(29)	24			(56)	46	(66)	54	100%	(122)
Ri	(88)	67	(2)	2	(29)	22	(2)	1	(121)	92	(10)	8	100%	(131)
Ga	(26)	16	(2)	1	(91)	56	(2)	1	(121)	74	(43)	26	100%	(164)
Na	(59)	39	(1)	1	(61)	41	(5)	3	(126)	84	(24)	16	100%	(150)
Pa	(23)	22	(1)	1	(28)	26	(5)	5	(57)	54	(48)	46	100%	(105)
Da	(32)	70	(3)	6	(7)	15	(4)	9	(46)	100			100%	(46)
Ni	(48)	64			(16)	21	(2)	3	(66)	88	(9)	12	100%	(75)
Total	(301)	38	(11)	1	(261)	33	(20)	2	(593)	74	(200)	26	100%	(793)

Table 4.2

Joint Distribution of Tones and Gamakas:
Rāga I, Performer 1

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Aa1	\	12	68	8	4	4	12	46	154	26.0
a2	ʌʌ		4		2		1		7	1.2
b1	ɣ						7		7	1.2
f1	∟	7			5	2			14	2.4
Ba1	\			2					2	.3
a2	v				3				3	.5
Ca1	/	6	10	9	27	14	3		69	11.6
a2	//				5				5	.8
f1	/ⁱ		3		7		6	2	18	3.0
f2	/ʌ				1				1	.2
h1	/‾				3	2			5	.8
Da1	/			7	1	1	1		10	1.6
a2	/V		3		1				4	.6
b1	ʌ						2		2	.3
Gamaka Total		25	88	26	59	23	32	48	301	50.8
E	•		2	2	1	1	1		7	1.2
F	—	2					2		4	.6

Table 4.2 (Continued)

Joint Distribution of Tones and Gamakas:
Rāga I, Performer 1

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Accent Total		2	2	2	1	1	3		11	1.9
G	ɣ	20	22	46	26	12	2	14	142	23.9
H	ʎ	9	7	45	35	16	5	2	119	20.1
Stylistic Total		29	29	91	61	28	7	16	261	44.0
Double Ornaments			2	2	5	5	4	2	20	3.3
Grand Total		56	121	121	126	57	46	66	593	100.0

Table 4.3 shows that of the total 793 tones, 4% are held tones. The held tones are Sa, Ga, Ma, and Pa. The tone Sa is found in both middle and high range; Ga in high range only. Among the held tones, Sa has the highest percentage (9%), next are tones Ga and Pa (6%), and tone Ma (less than 1%).

Table 4.3

Distribution of Held Tones:
Rāga I, Performer 1

		Range							
		Low		Middle		High			
Tone	Frequency of Tones	Unornamented	Ornamented	Unornamented	Ornamented	Unornamented	Ornamented	Total	%
Sa	122			4	2	4	1	11	9
Ri	131								
Ga	164					7	3	10	6
Ma	150			1				1	1
Pa	105			6				6	6
Da	46								
Ni	75								
Total	793			11	2	11	4	28	4

Rāga I, Performer 2

Principal Melody: Male Singer

Performer: Semmangudi Srīnīvasa Aiyer (Iyer)

Melodic Accompaniment: Vīnā

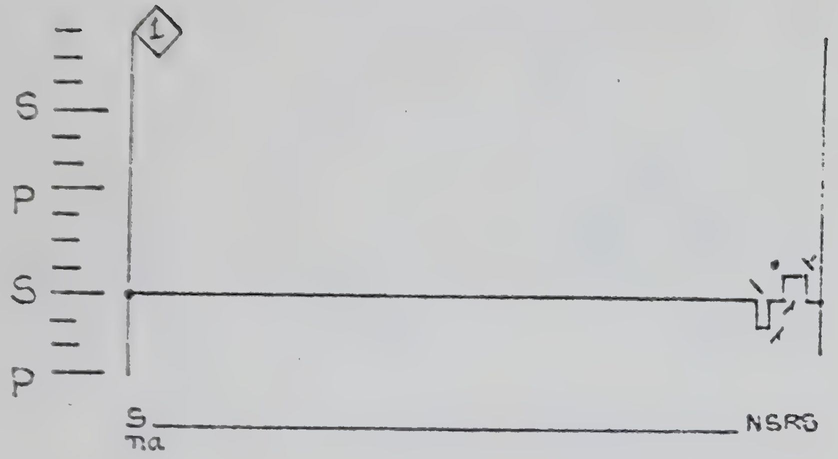
Drone Accompaniment: Tambūra

Performance Duration: 3 minutes, 51.3 seconds

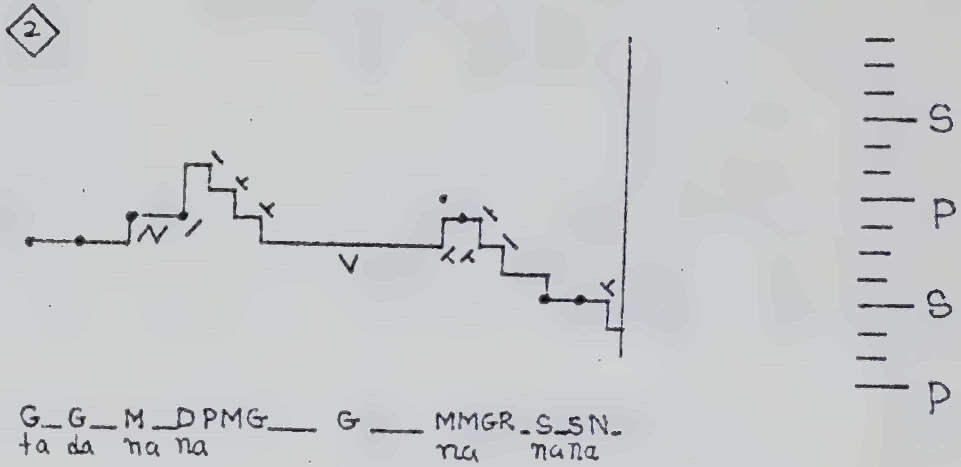
Disc: UNESCO COLLECTION--A MUSICAL ANTHOLOGY OF THE ORIENT; THE MUSIC OF INDIA, Record IV
Bärenreiter-musicaphon BM30L2021

Extract From:
Kriti: "Dakshināmūrti"
Rāga: Shankarābharana
Tāla: Jhampa
Language: Sanskrit
Composer: Muttuswāmi Dīkshitar

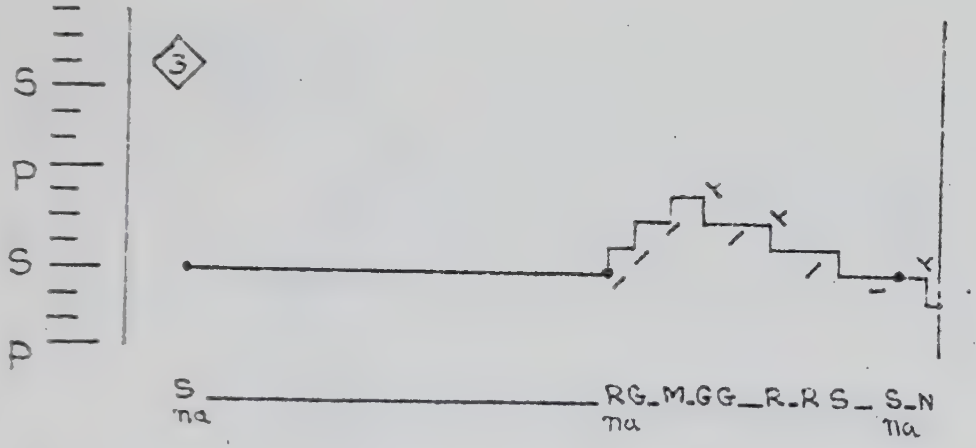
1


S
P
S
P
S
na
NSRG

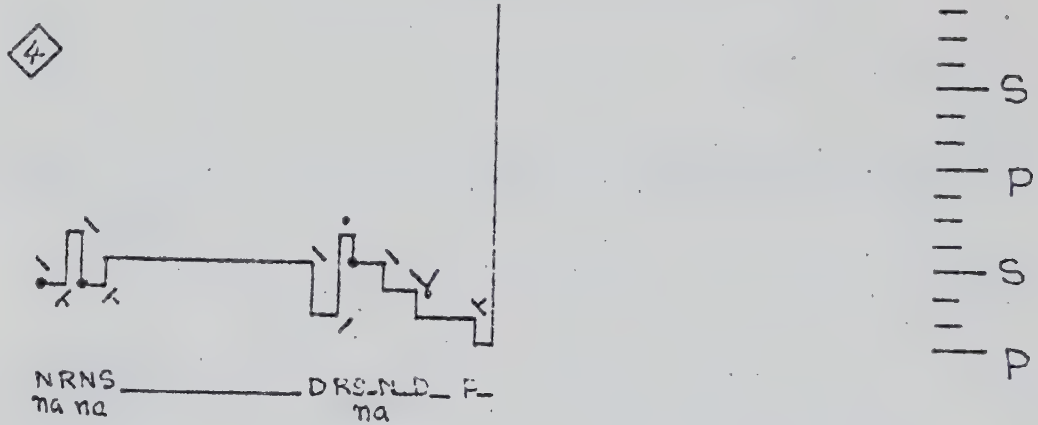
2


S
P
S
P
G_G_M_DPMG___ G ___ MMGR_S_SN_
ta da na na na nana

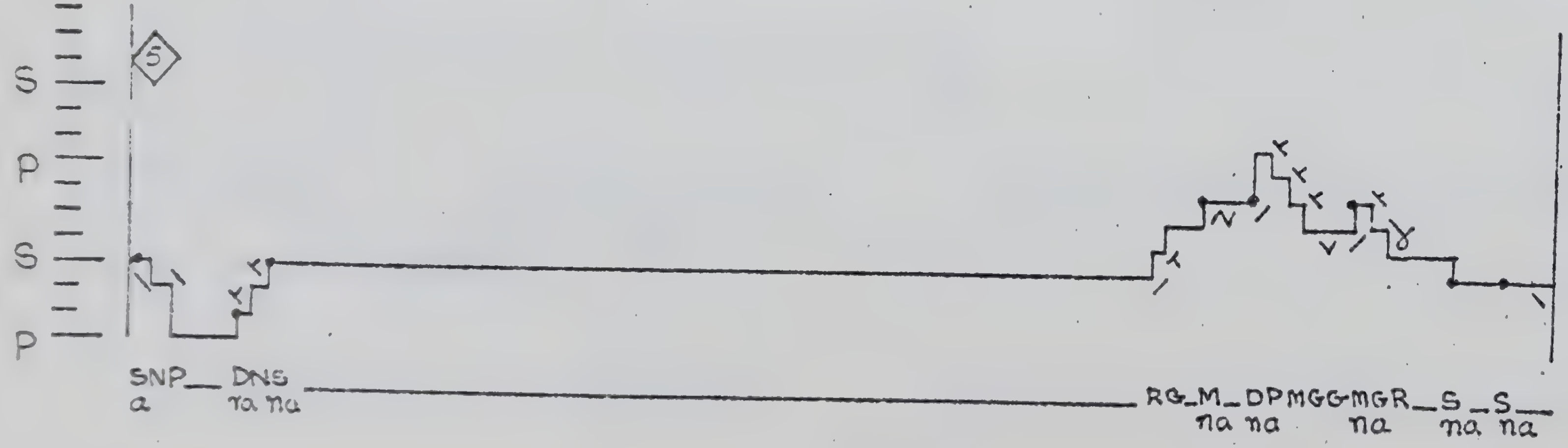
3


S
P
S
P
S
na
RG_M_GG_R_R S_ S_N
na na

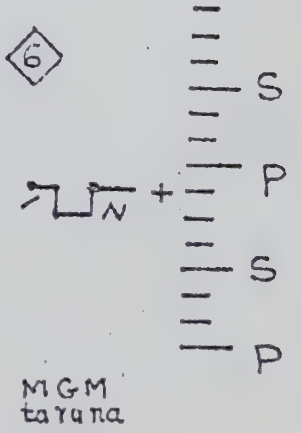
4


S
P
S
P
NRNS
na na
DRS_N_D_ P_
na

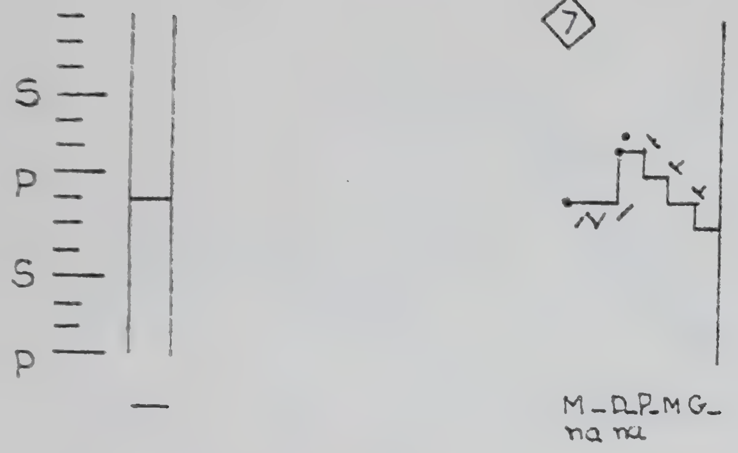
5


S
P
S
P
SNP__ DNS
a na na
RG_M_DPMGGMGR_S_S__
na na na na na

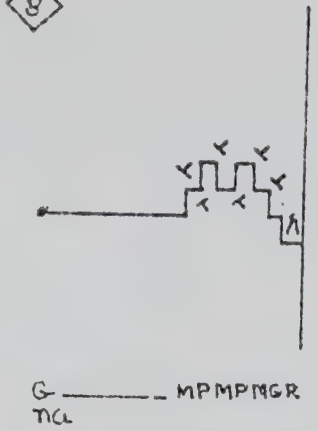
6


S
P
S
P
MGM
tarana

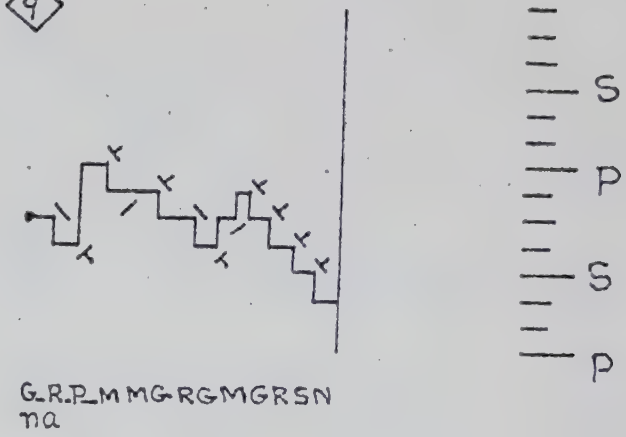
7


S
P
S
P
M_D.P.M.G_
na na

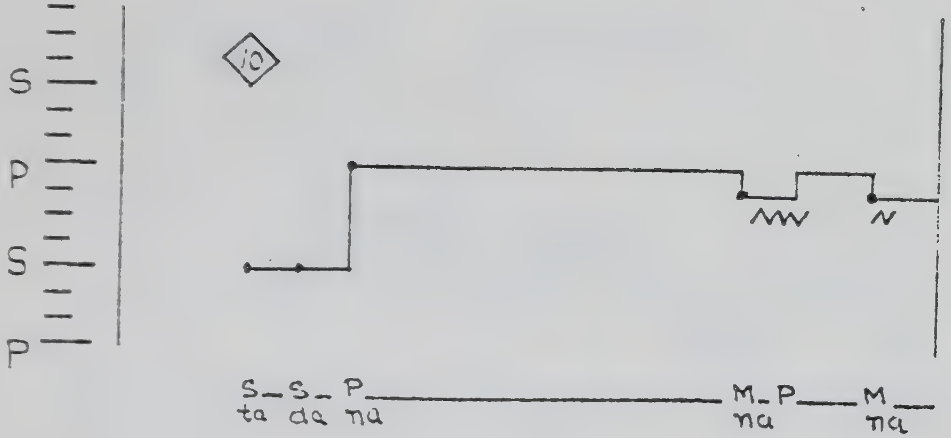
8


G______ MPMPMGR
na

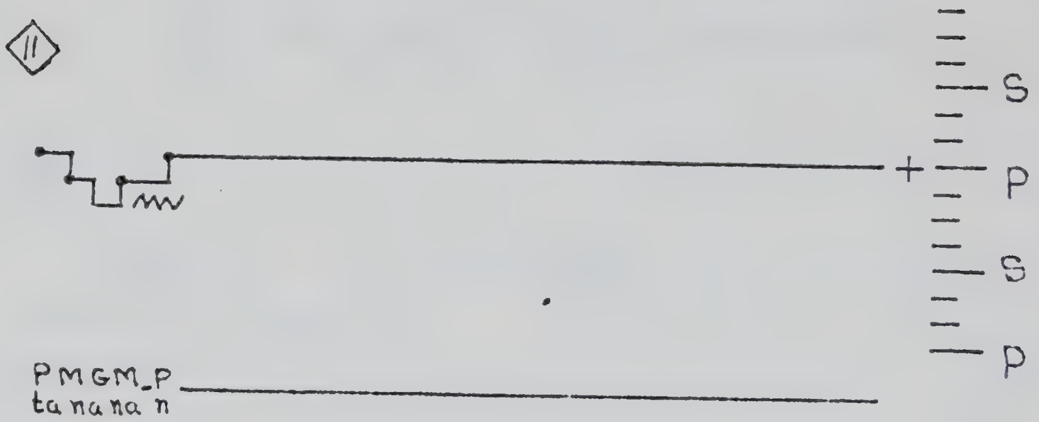
9

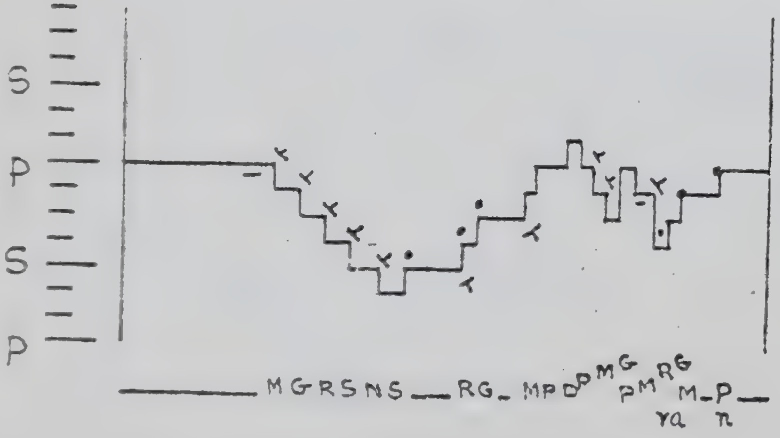

G.R.P_MMGRGMGRSN
na
S
P
S
P

10

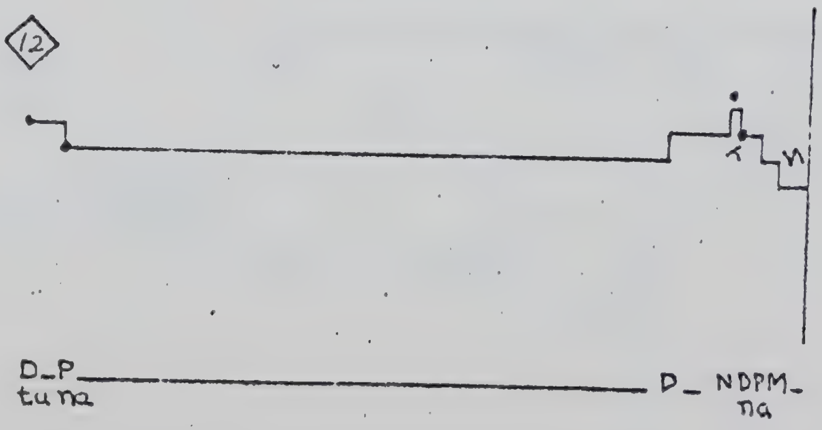

S
P
S
P
S_S_P
ta da na
M_P
na
M
na

11

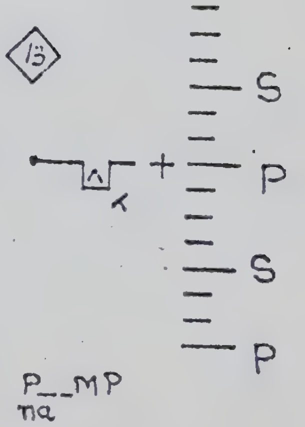

PMGM_P
ta na na n
S
P
S
P

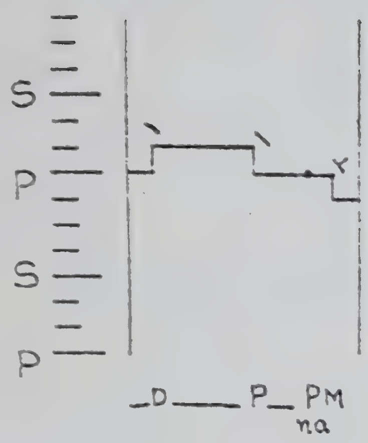

S
P
S
P
MGRSNS__RG_MPD P M G P M R G M_P
ra n

12

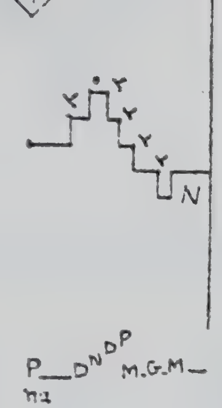

D_P
tu na
D_ NDPM_
na

13

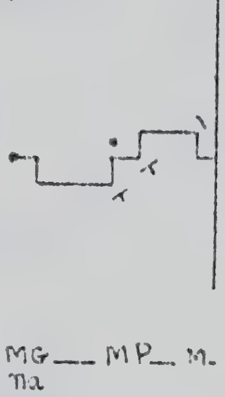



S
P
S
P
_D___P_PM
na

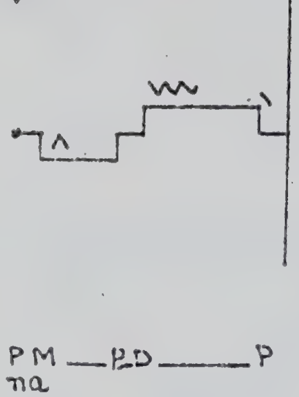
14


N
P_D^N D^P M.G.M_
na

15



16



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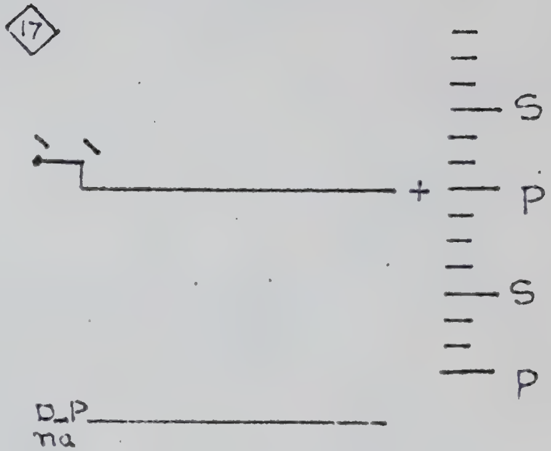
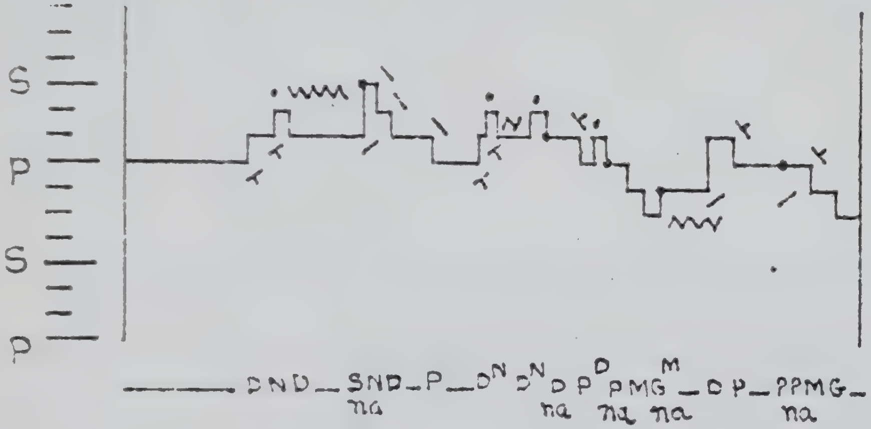
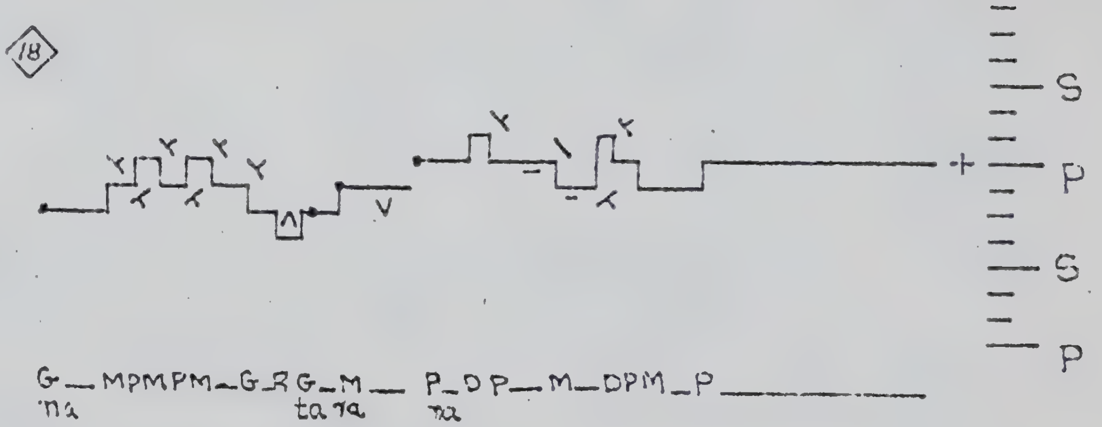
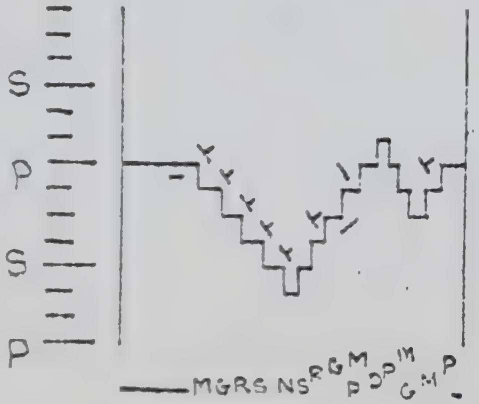


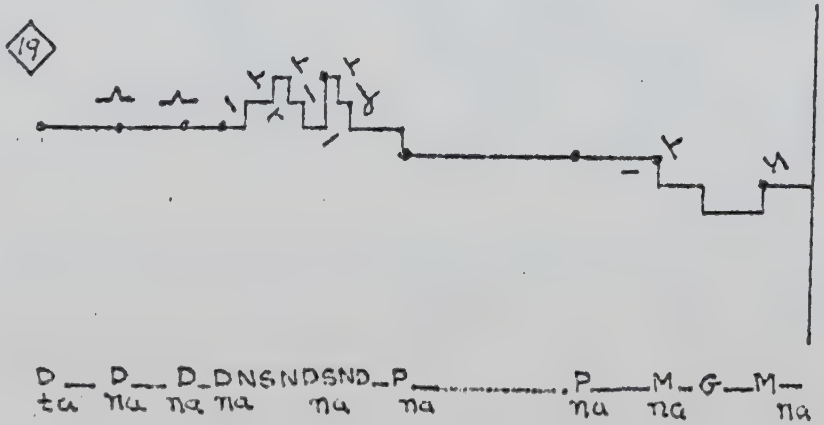

S
P
S
P
N
_____DND_SND_P_D^N D^N D P ^D PMG ^M _D P_PPMG_
na na na na na

18

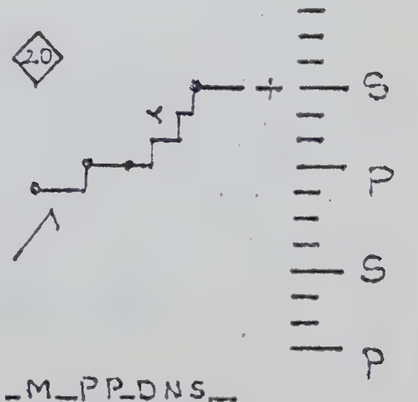

+
S
P
S
P
G_MPMPM_G R G_M_ P_DP_M_DPM_P
na ta na na

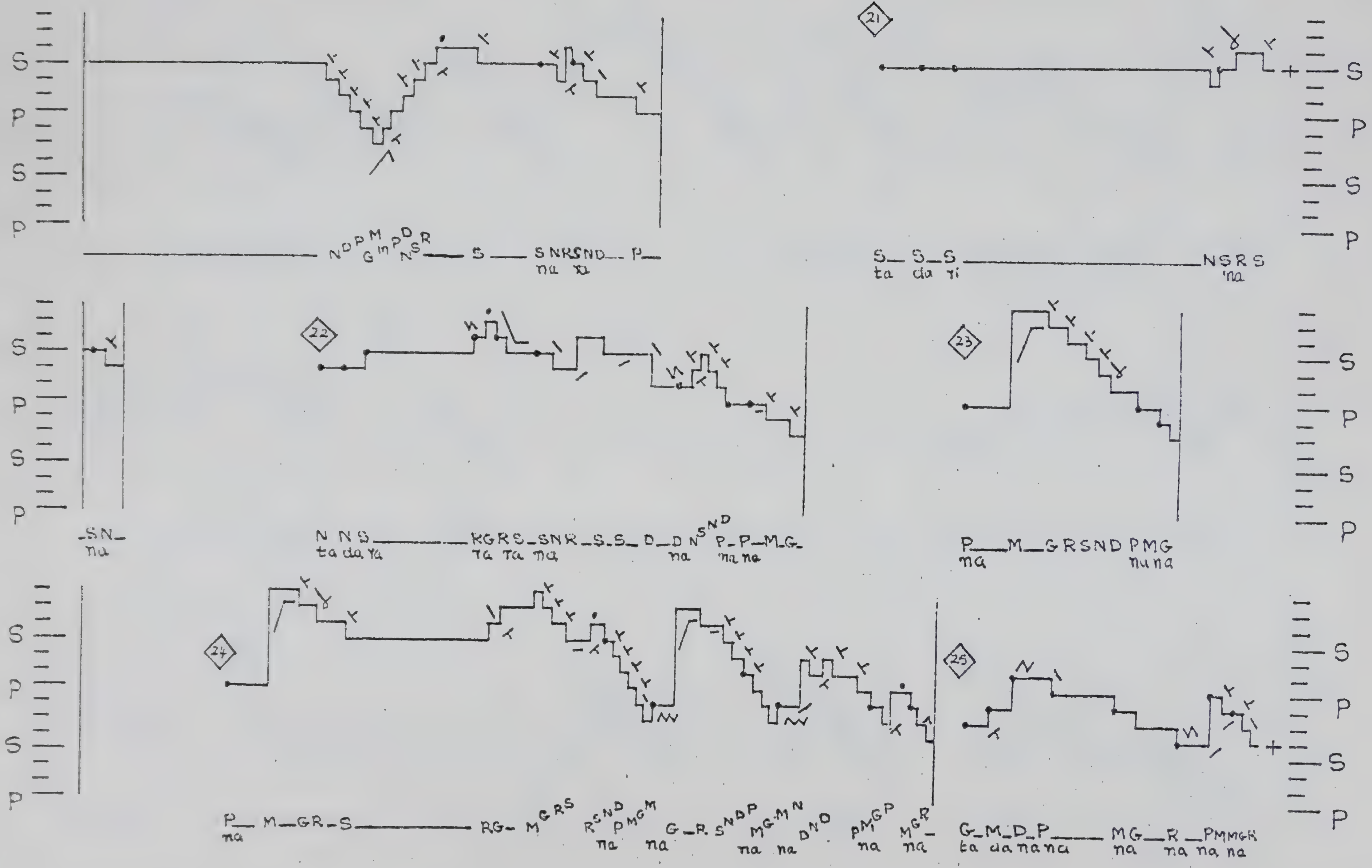

S
P
S
P
____MGRS NS^RG^M P D^P ^M G M ^P

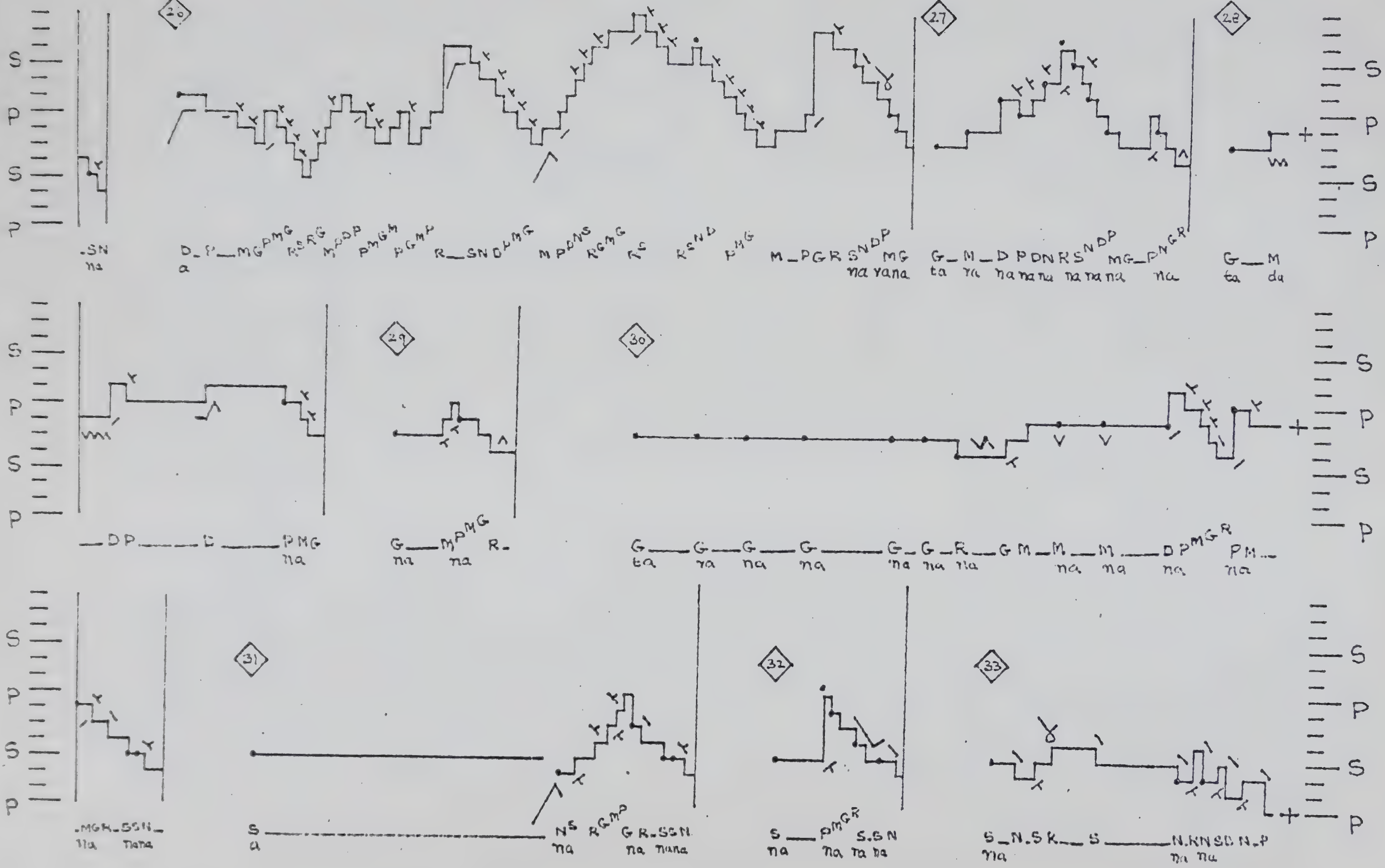
19

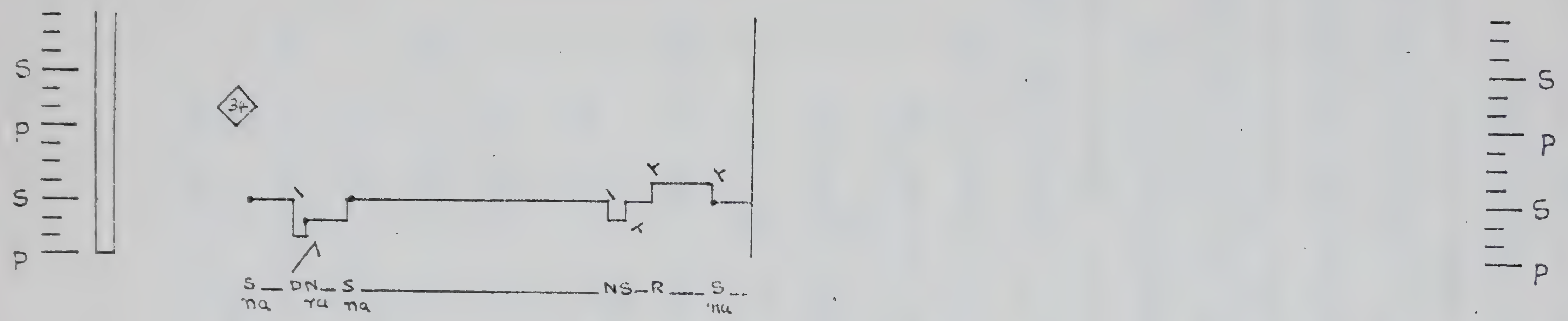

D__D__D_DNSNDSND_P_______P___M_G_M_
ta na na na na na na na na

20


+
S
P
S
P
_M_PP_DNS_
ta da ri ri


S
P
S
P
N D P M G m P D N S R — S — SNRSND — P —
na ra
21
S — S — S ————— NSRS
ta da ri na
-SN-
na
22
N N S ————— RGRS — SNR — S — S — D — D N S N D P — P — M — G —
ta da ra ra ra na na na na
23
P —— M — GRSND PMG
na nu na
24
P — M — GR — S ————— RG — M G R S R S N D P M G M G — R S N D P M G M N D N D P M G P M G R —
na na na na na na na
25
G — M — D — P ———— MG — R — PMMGR
ta da na na na na na na


S
P
S
P
26
27
28
29
30
31
32
33
-SN
na
D-P—MG PMG RSRG MDDP PMGM PGMP R—SNDPMG MPDNS RGMG RS RSND PMG M—PGR SNDP MG
a
na rana
G—M—D PDNRS NDP MG—PNGR
ta ra nanana nanana na
G—M
ta da
—DP——D——PMG
na
G—MPMG R-
na na
G—G—G—G——G-G-R—GM—M—M——DPMGR PM—
ta ra na na na na na na na na na
-MGR-SSN-
na nana
S————————NS RGMP GR-SSN
a na na nana
S—PMGR S.SN
na na ra ta
S-N.SK—S———N.KNSD N-P
na na na


S
P
S
P
34
Y
Y
r
S — DN — S —— NS — R —— S ——
na ru na
nu

Performance: Rāga I, Performer 2

The total duration of the performance as it appears on the transcription is 231.3 seconds, of which the soloist occupies 165.9 seconds. Silence in the soloist's part, during which the accompaniment continues, occupies 66.4 seconds. There are 34 phrases in total. The range of this performance is from low Pa to high Ga (less than two octaves). The performance starts and ends on middle Sa.

The performer Semmangudi Srīnivāsa Iyer uses 23 types of ornaments, including gamakas, accents and stylistics, and some double ornaments. Seven type-A gamakas are used.

Aa1 is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni. The interval size is:

2nd on $\overset{\mathrm{RS}}{\mathrm{S}\_}$, $\overset{\mathrm{GR}}{\mathrm{R}\_}$, $\overset{\mathrm{MG}}{\mathrm{G}\_}$, $\overset{\mathrm{PM}}{\mathrm{M}\_}$, $\overset{\mathrm{DP}}{\mathrm{P}\_}$, $\overset{\mathrm{ND}}{\mathrm{D}\_}$, and $\overset{\mathrm{SN}}{\mathrm{N}\_}$;

3rd on $\overset{\mathrm{MR}}{\mathrm{R}\_}$, $\overset{\mathrm{NP}}{\mathrm{P}\_}$, and $\overset{\mathrm{SD}}{\mathrm{D}\_}$.

Aa2 is used on tones Ri, Ma, and Da. The interval size is:

2nd (x2) on $\overset{\mathrm{GRGR}}{\mathrm{R}\_\_\_}$ and $\overset{\mathrm{NDND}}{\mathrm{D}\_\_\_}$;

3rd (x2) on $\overset{\mathrm{PGPG}}{\mathrm{M}\_\_\_}$.

Aa4 is used on tone Da only. The interval size is:

2nd (x5) on $\overset{\mathrm{NDNDNDNDND}}{\mathrm{D}\_\_\_\_\_\_\_\_\_}$.

Aa6 is used on tone Ma only. The interval size is:

2nd (x7) on $\overset{\mathrm{MGMGMGMGMGMGMG}}{\mathrm{M}\_\_\_\_\_\_\_\_\_\_\_\_\_}$.

Ab1 is used on tones Ri and Da. The interval size is:

MRM
3rd on R__;

SDN
3rd and 2nd on D__.

Ab2 is used on tone Da only. The interval size is:

NDNDNDN
2nd (x3) on D_______.

Af1 is used on tone Sa only. The interval size is:

RSS
2nd and prime on RS_.

Two type-B gamakas are used.

Ba1 is used on tones Sa and Ni. The interval size is:

SN ND
2nd on S_ and D_.

Ba2 is used on tones Ga and Ma. The interval size is:

GRG MGM
2nd on G__ and M__.

Seven type-C gamakas are used.

Ca1 is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da and Ni.

The interval size is:

NS SR RG GM MP PD DN
2nd on S_, R_, G_, M_, P_, D_, and D_;

DS NR GP MD
3rd on S_, R_, P_ and D_;

DR RP MN
4th on R_, P_ and N_;

PG
6th on G_.

Ca2 is used on tone Ma only. The interval size is:

2nd (x2) on $\overset{\text{GMGM}}{\text{M\_\_\_}}$.

Ca3 is used on tone Ma only. The interval size is:

2nd (x3) on $\overset{\text{GMGMGM}}{\text{M\_\_\_\_\_}}$.

Ca4 is used on tone Ma. The interval size is:

2nd (x4) on $\overset{\text{GMGMGMGM}}{\text{M\_\_\_\_\_\_\_}}$.

Cf1 is used on tones Ma and Ni. The interval size is:

3rd and 2nd on $\overset{\text{GPM}}{\text{M\_\_}}$ and $\overset{\text{DSN}}{\text{N\_\_}}$;

4th and 2nd on $\overset{\text{PSN}}{\text{N\_\_}}$.

Cg1 is used on tone Da only. The interval size is:

3rd and 2nd on $\overset{\text{P\_ND}}{\text{D\_\_\_}}$.

Ch1 is used on tones Ri, Ga, Ma and Da. The interval size is:

5th and prime on $\overset{\text{PRR}}{\text{R\_\_}}$;

6th and prime on $\overset{\text{SDD}}{\text{D\_\_}}$.

7th and prime on $\overset{\text{PMM}}{\text{M\_\_}}$ and $\overset{\text{MGG}}{\text{G\_\_}}$.

Three type-D gamakas are used.

Da2 is used on tone Da only. The interval size is:

2nd (x2) on $\overset{\text{DNDN}}{\text{D\_\_\_}}$.

Db1 is used on tones Ri and Ma. The interval size is:

2nd on $\overset{\text{RGR}}{\text{R\_\_}}$ and $\overset{\text{MPM}}{\text{M\_\_}}$.

Dgl is used on tone Da only. The interval size is:

D_ND_
2nd on D____.

Accent-E is used on tones Sa, Ri, Ga, Da, and Ni.

Accent-F is used on tones Sa, Ri, Ma, and Pa.

Stylistic-G is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

RS GR MG PM DP ND SN
2nd on S_, R_, G_, M_, P_, D_, and N_;

PG
3rd on G_.

Stylistic-H is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

NS RG GM MP PD DN
2nd on S_, G_, M_, P_, D_, and N_;

NR GP
3rd on R_ and P_;

RP
4th on P_;

SP
5th on P_.

Double ornaments are used on six tones Sa, Ri, Ma, Pa, Da, and Ni.

Table 4.4 shows that a total of 498 tones were used by the performer of which 70% received some kind of ornament and 30% had no ornament. Of the 498, 26% were tones with gamaka, 3% were tones with accent, 37% were tones with stylistic, and 4% were tones with double ornament.

The tones Ri and Ni are almost always ornamented (96% Ri and 91% Ni). The tones Sa and Ga are ornamented approximately half of the time (45% Sa and 55% Ga). The tones Ma, Pa, and Da are between these two extremes (78% Ma, 60% Pa and 76% Da).

In Table 4.5 it can be seen that types Aa1, Ca1 and stylistics account for a larger proportion of ornaments than any other types (11.6% Aa1, 9.0% Ca1, 52.9% stylistics). Some tones receive more of a given gamaka than do others. Of the total 40 type Aa1, the tones Ni, Da, Ri and Pa receive 11, 10, 8, and 7 respectively. Of the total 31 type Ca1, the tone Ma receives the highest number (8), the rest are spread over the other tones. Of the stylistics, tones Ni, Ma, and Ga receive more than any other tones (30, 36, and 35 respectively).

More varieties of type-A gamakas including subtypes occur on tones Ri, Ma, and Da; more type-C on tones Ma and Da; type-B and type-D are spread thinly over several tones (Sa, Ga, Ma, Ni and Ri, Ma, and Da respectively). Accent-E is used on five tones (Sa, Ri, Ma, and Pa). Both stylistic-G and stylistic-H are used on all seven tones but stylistic-G is used much more than H (149 and 34 respectively). Double ornaments are found on all tones except Ga.

Table 4.6 shows that of the total 498 tones, 4% are held tones. The held tones are Sa, Ga, Pa, and Da. The tone Sa is found in both

Table 4.4
Percentage Distribution of Tones and Gamakas:
Rāga I, Performer 2

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(7)	10	(2)	3	(22)	31	(1)	1	(32)	45	(39)	55	100%	(71)
Ri	(25)	48	(2)	4	(16)	31	(7)	13	(50)	96	(2)	4	100%	(52)
Ga	(8)	10	(2)	2	(35)	43			(45)	55	(37)	45	100%	(82)
Ma	(34)	36	(1)	1	(36)	38	(3)	3	(74)	78	(21)	22	100%	(95)
Pa	(13)	14	(5)	6	(28)	35	(3)	4	(49)	60	(33)	40	100%	(82)
Da	(28)	46	(1)	2	(16)	26	(1)	2	(46)	76	(15)	24	100%	(61)
Ni	(13)	23	(2)	4	(30)	55	(3)	5	(50)	91	(5)	9	100%	(55)
Total	(128)	26	(15)	3	(183)	37	(18)	4	(346)	70	(152)	30	100%	(498)

Table 4.5

Joint Distribution of Tones and Gamakas:
Rāga I, Performer 2

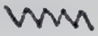
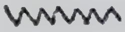
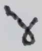
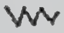
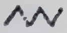
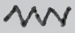
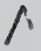
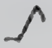
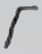
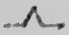
Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Aa1		1	8	1	2	7	10	11	40	11.6
a2			3		2		1		6	1.7
a4							1		1	.3
a6					1				1	.3
b1			4				4		8	2.3
b2							1		1	.3
f1		2							2	.6
Ba1		1						1	2	.6
a2				2	3				5	1.4
Ca1		3	4	4	8	6	5	1	31	9.0
a2					6				6	1.7
a3					2				2	.6
a4					3				3	.9
f1					3			2	5	1.4
g1							1		1	.3
h1			1	1	2		1		5	1.4
Da2							2		2	.6
b1			5		2				7	2.0
h1							2		2	.6

Table 4.5 (Continued)

Joint Distribution of Tones and Gamakas:
Rāga I, Performer 2

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Gamaka Total		7	25	8	34	13	28	13	130	37.6
E	•	1	1	2			1	2	7	2.0
F	—	1	1		1	5			8	2.3
Accent Total		2	2	2	1	5	1	2	15	4.3
G	⋎	14	13	31	31	19	13	28	149	43.1
H	λ	8	3	4	5	9	3	2	34	9.8
Stylistic Total		22	16	35	36	28	16	30	183	52.9
Double Ornaments		1	7		3	3	1	3	18	5.2
Grand Total		32	50	45	74	49	46	50	346	100.0

Table 4.6

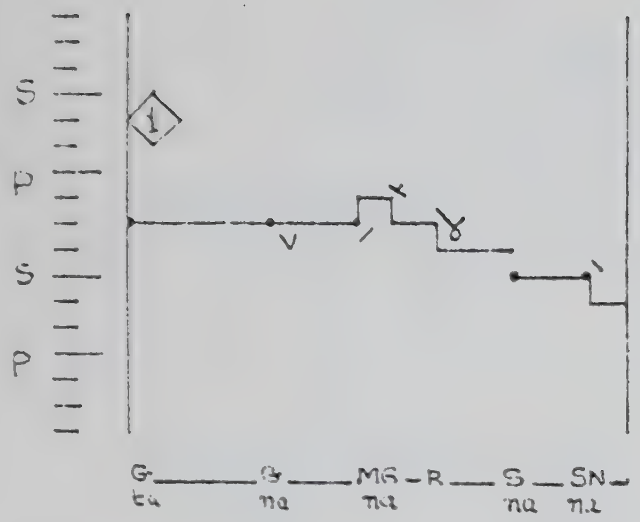
Distribution of Held Tones: Rāga I, Performer 2

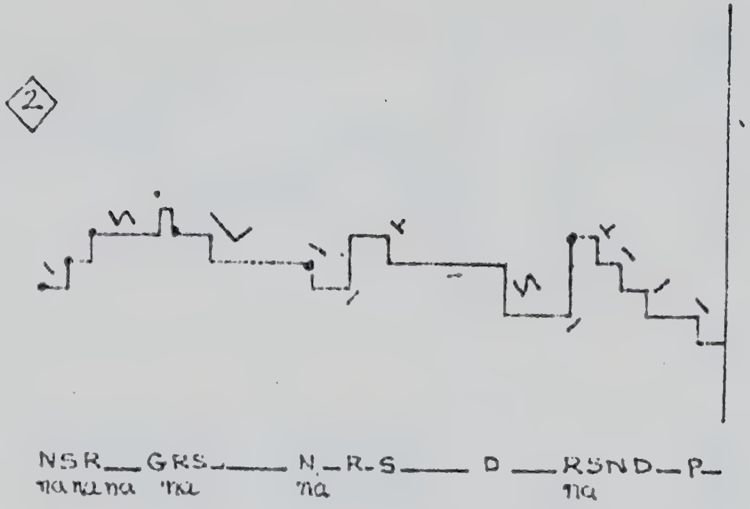
		Range							
		Low		Middle		High			
Tone	Frequency of Tones	Unornamented	Ornamented	Unornamented	Ornamented	Unornamented	Ornamented	Total	%
Sa	71			5	2	3	1	11	1
Ri	52								
Ga	82			2				2	2
Ma	95								
Pa	82			3	4			7	9
Da	61				1			1	2
Ni	55								
Total	498			10	7	3	1	21	4

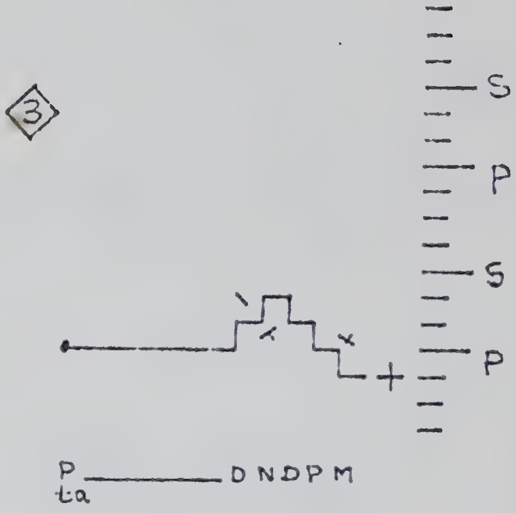
middle and high range. Among the held tones, Pa has the highest percentage (90%); next are tones Ga and Da (2%), and tone Sa (less than 1%).

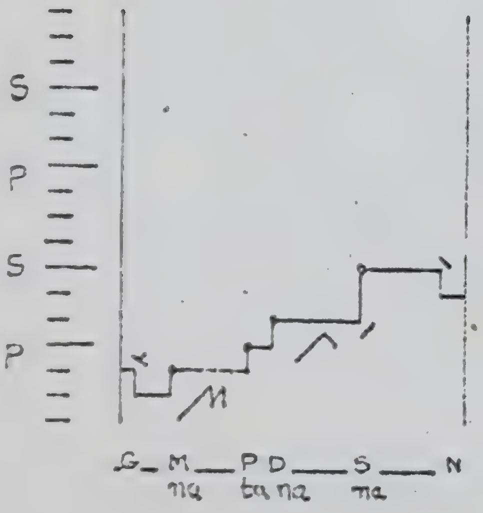
Rāga I, Performer 3

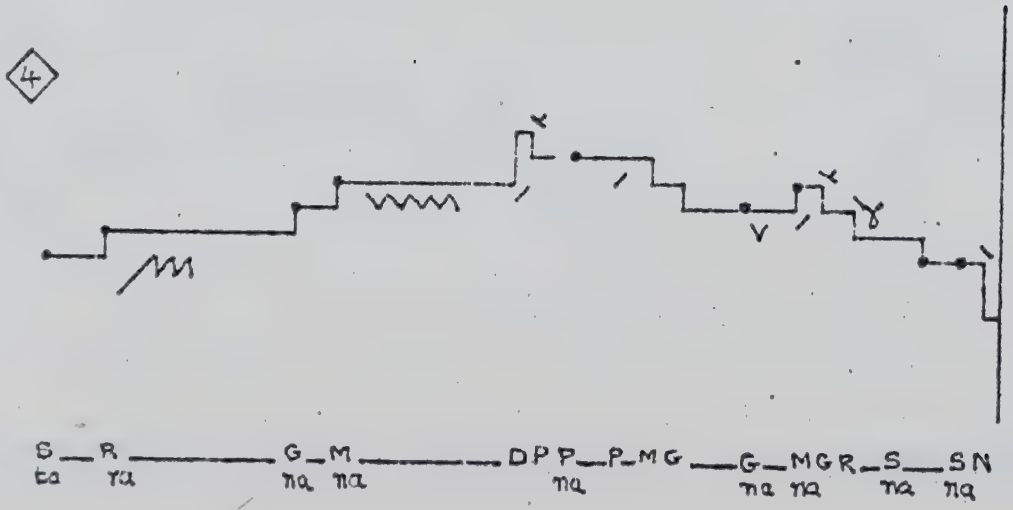
Principal Melody: Male Flutist
Performer: T. Viswanathan
Melodic Accompaniment: Violin
Drone Accompaniment: Tambūra and Śruti box
Performance Duration: 4 minutes, 38.3 seconds
Disc: PALLAVI, SOUTH INDIAN FLUTE MUSIC
Nonesuch, Explorer Series H-72052 (Stereo)
Extract From: "Rāgam--Tānam--Pallavi"
Rāga: Śhankarābharaṇam
Tāla: Miśra Cāpu

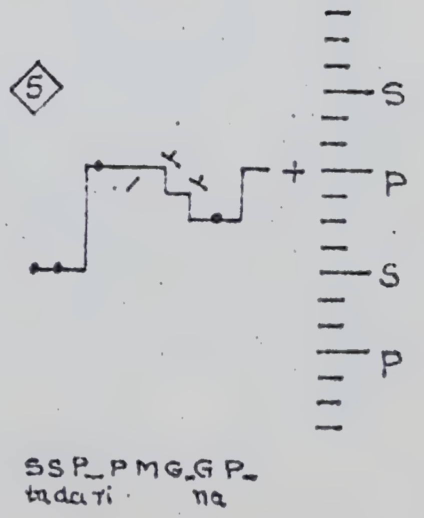

S
P
S
P
1
G—— G—— MG–R—— S—— SN–
ta na na na na

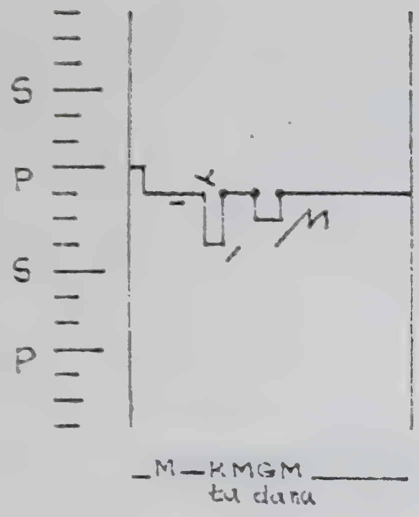

2
NSR— GRS— N–R–S—— D——RSND–P–
nanana na na na


3
S
P
S
P
P——DNDPM
ta

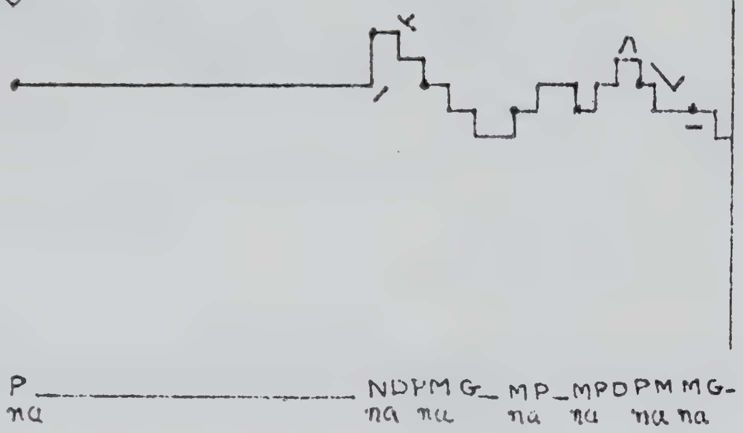

S
P
S
P
G–M–PD—S—N
na tana na


4
S–R——G–M——DPP–P–MG–G–MGR–S–SN
ta ra na na na na na na na

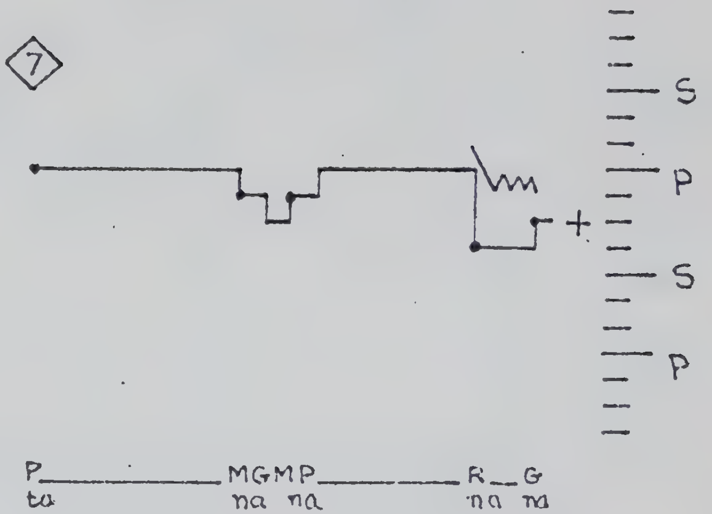

5
S
P
S
P
SSP–PMG.GP–
tadati na

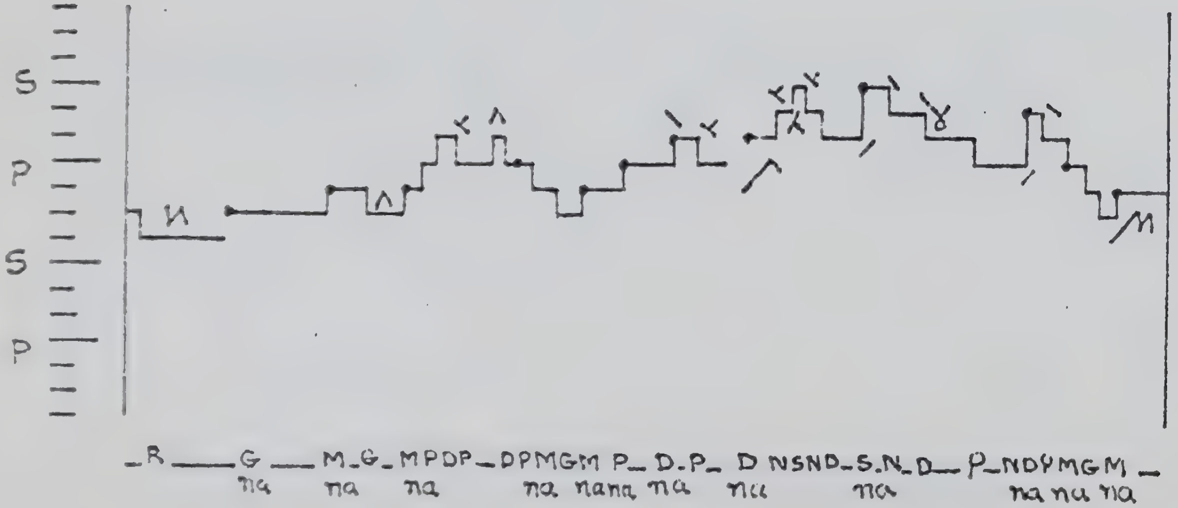

S
P
S
P
_M—KMGM ______
tu dana

⑥

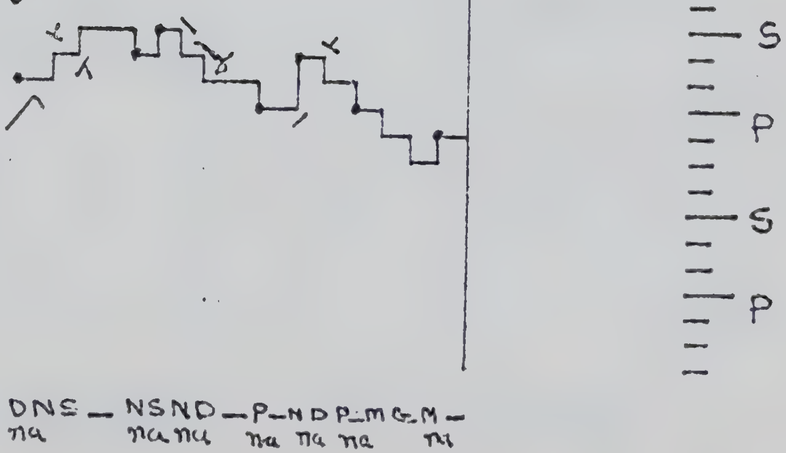

P ______________ NDPM G_ MP_MPDPM MG-
na na nu na nu na na

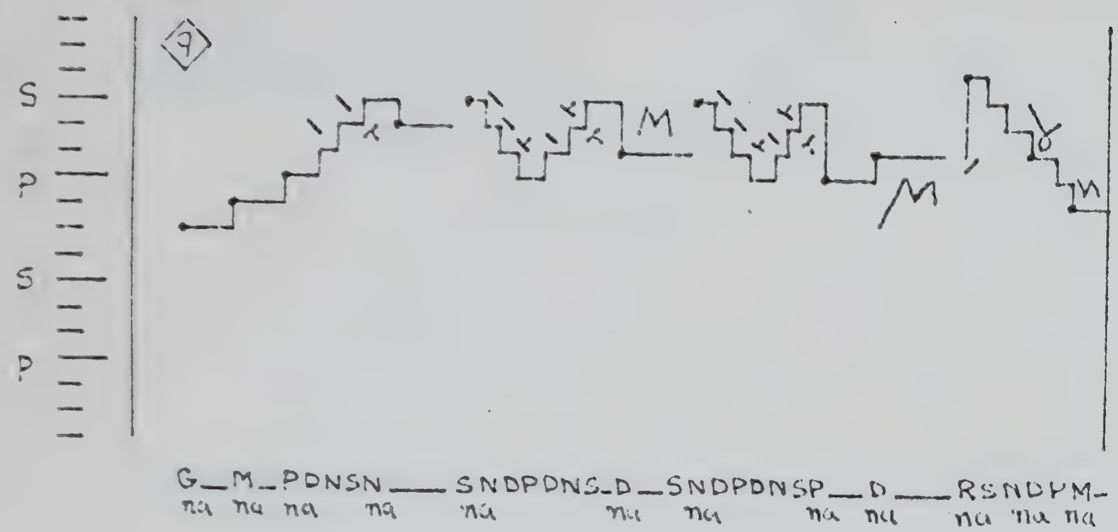
⑦

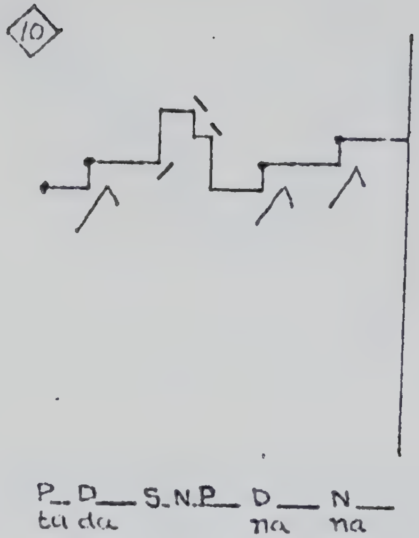

S
P
S
P
P__________MGMP__________R__G
ta na na na na


S
P
S
P
_R ____G ___M_G_MPDP_DPMGM P_ D.P_ D NSND_S.N_D_P_NDPMGM _
na na na na nana na nu na na nu na

⑧


S
P
S
P
DNS _ NSND _P_NDP_MG_M _
na nanu na na na ni


9
S
P
S
P
M
M
M
G_M_PDNSN___SNDPDNS_D_SNDPDNSP__D___RSNDPM-
na na na na na na na na na na na na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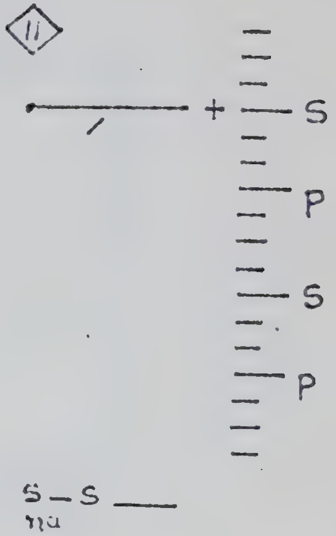
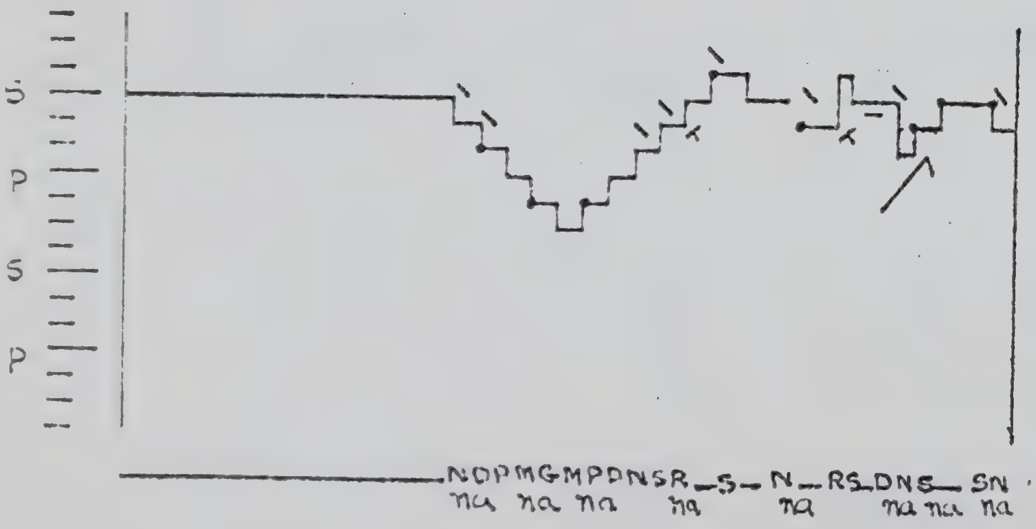
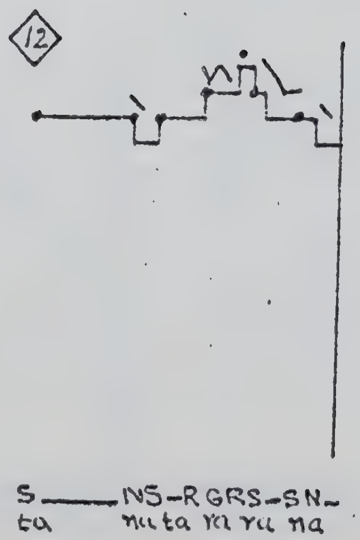
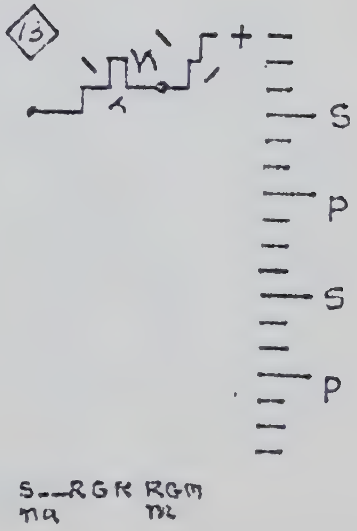
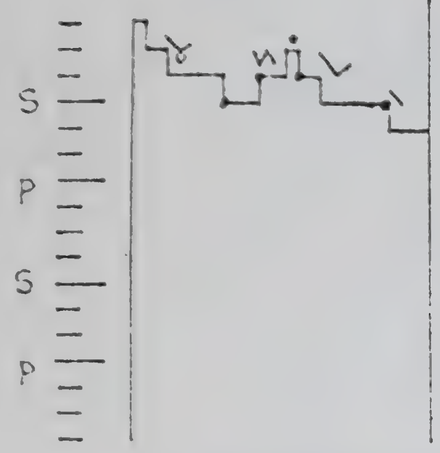
P_D__S.N.P_D__N__
ta da na na


11
+
S
P
S
P
S–S___
na


S
P
S
P
NDPMGMPDNSR_S_N_RS_DNS_SN
na na na na na na na na

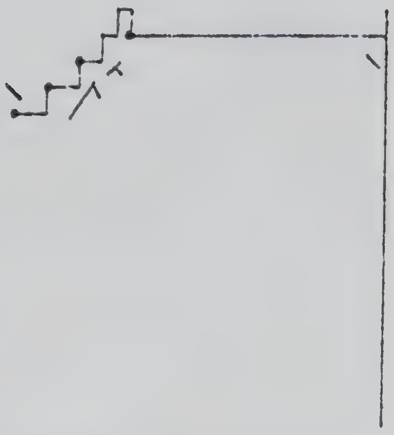

12
S___NS-RGRS-SN-
ta na ta ra ra na


13
+
S
P
S
P
S--RGR RGm
na na



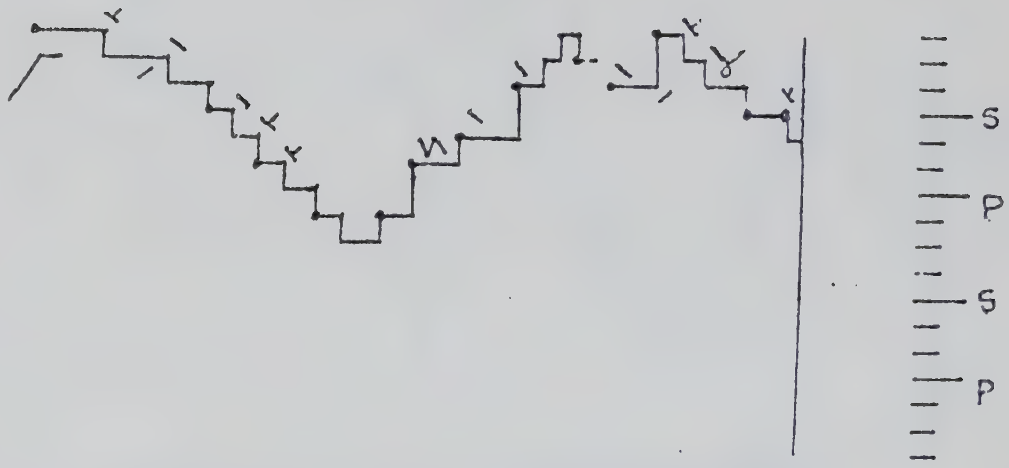
.G.R-S_RG.R.S_SN.
na na na na

14

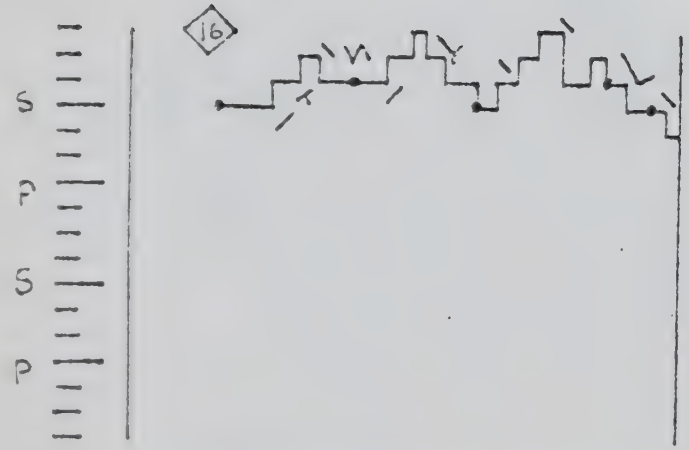


NSRGMG
tanana na

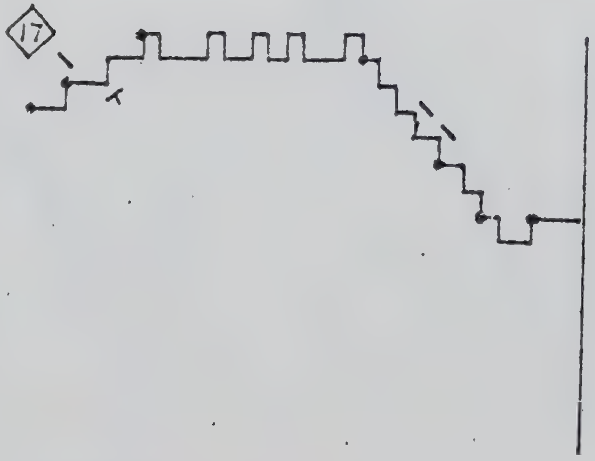
15



M - G.G_R.S.N_D_PM-G-M D-N_RGMG_R.MGR SSN
na na na na na na na na na na na na na



S_RGRRGMGR SRGMRGRS_SN
na na na na na



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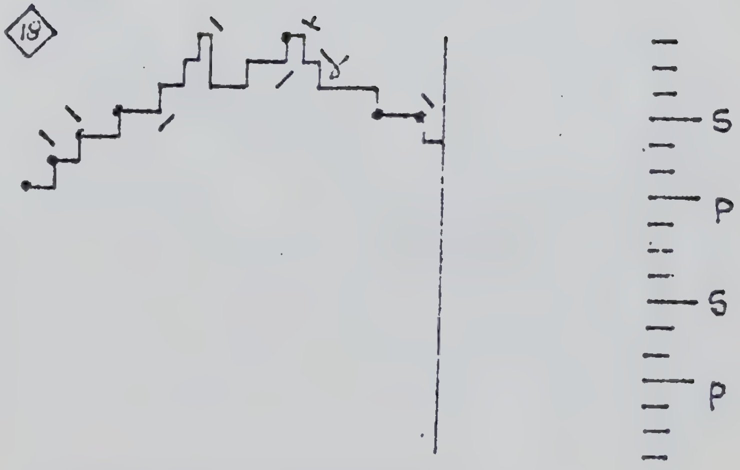

PDNSRGMRG_MGR-S_SN
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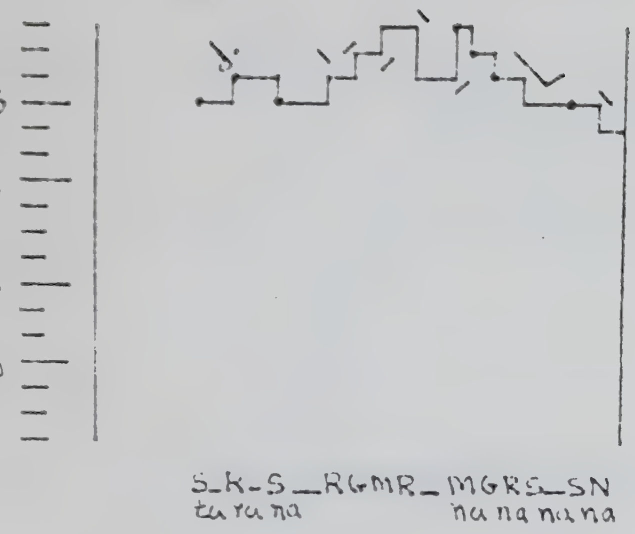

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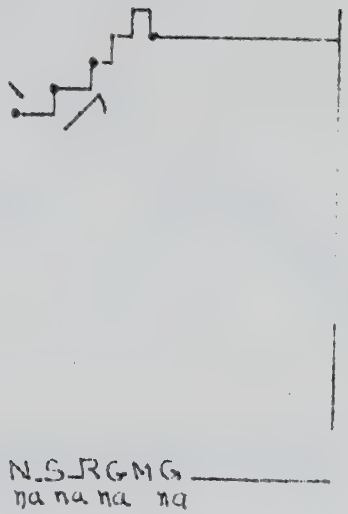

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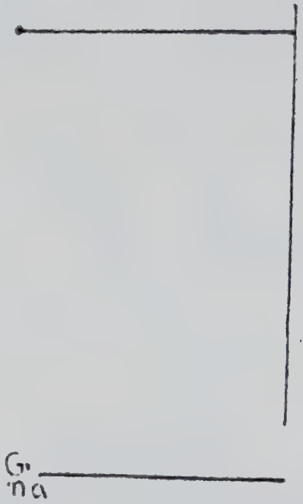

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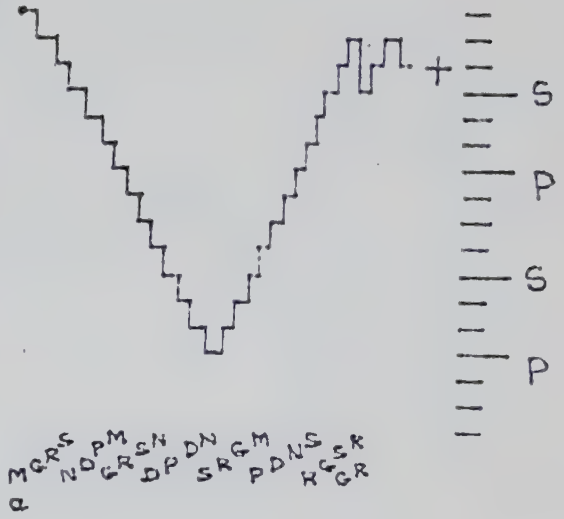

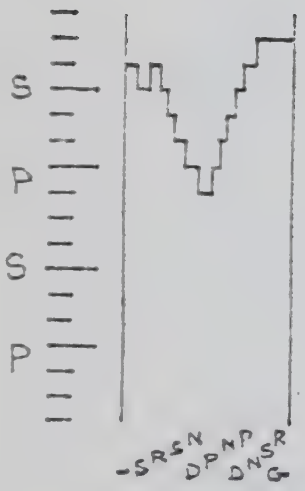

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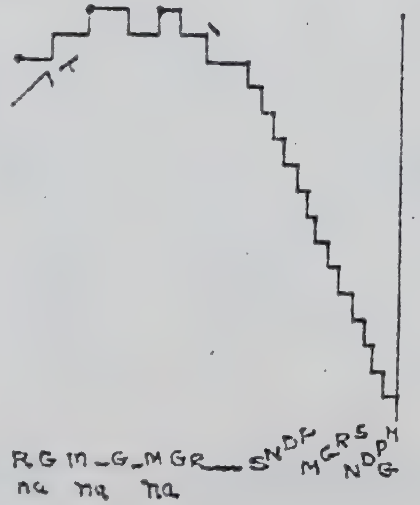

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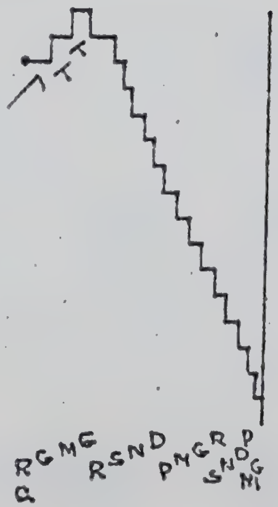

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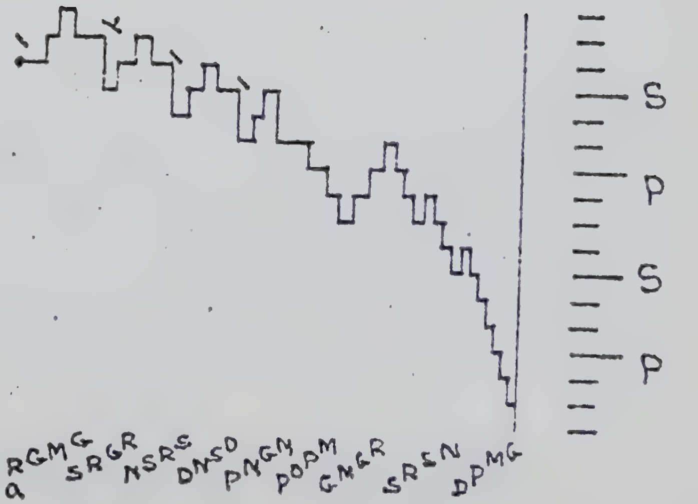

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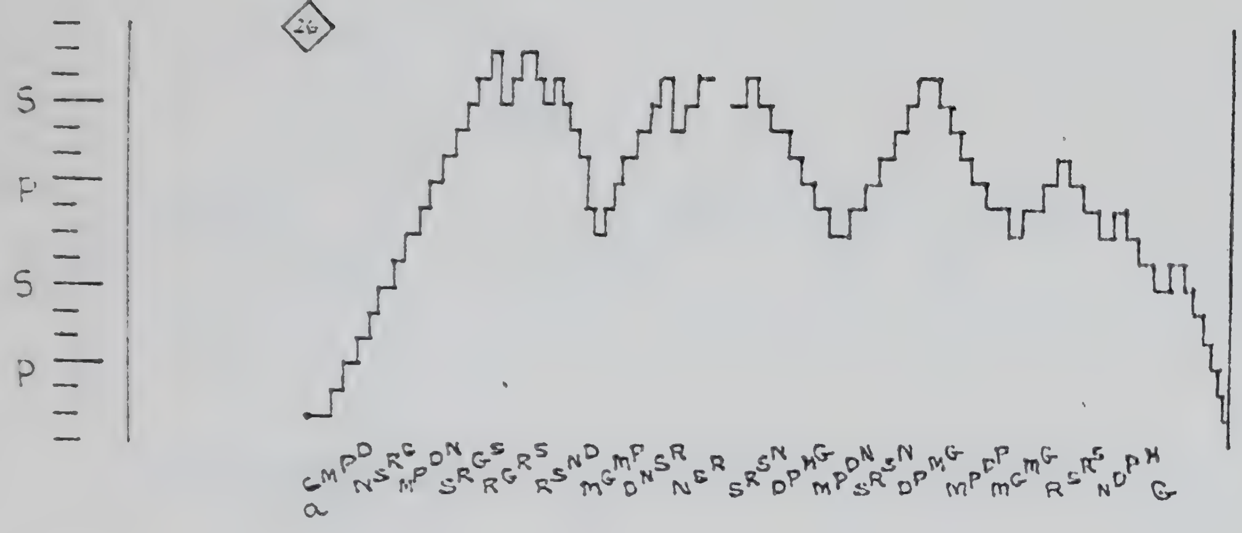
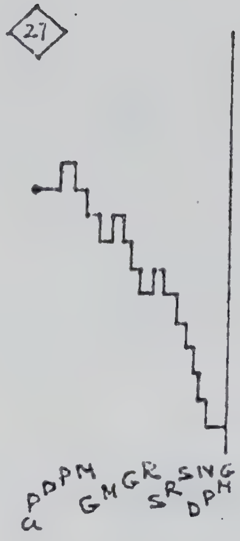
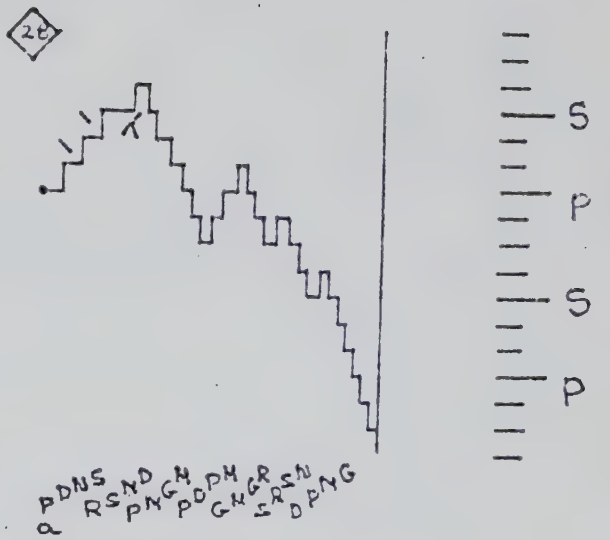

S
P
S
P
CMPD NSRG MP DN SRGS RGRS RSND MGMP DNSR NGR SRSN DPMG MPDN SRSN DPMG MPDP MGMG RSRS NDPM G
a

27


PDPM GMGR SRSNG DPM
a

28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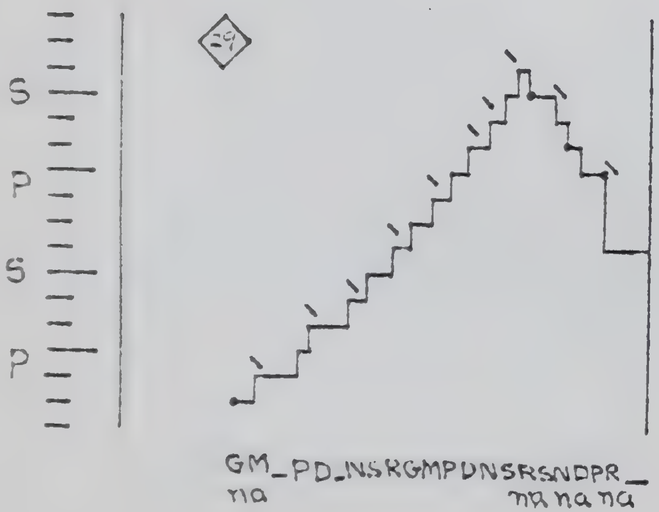
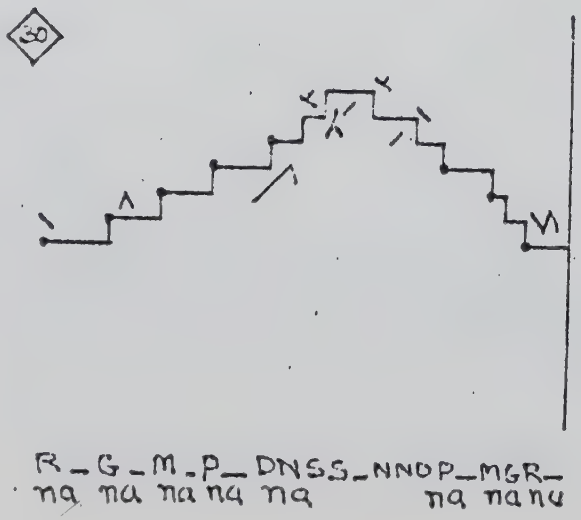
a
S
P
S
P

29


S
P
S
P
GM_PD_NSRGMPDNSRSNDPR_
na nanana

30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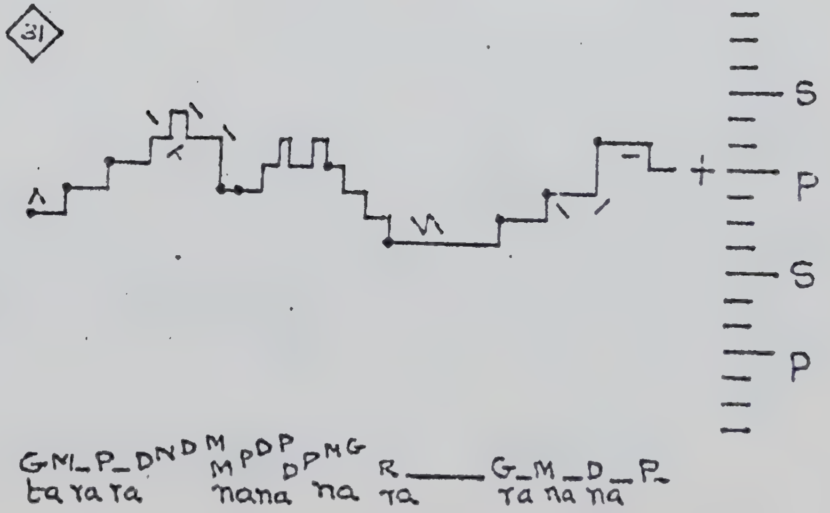
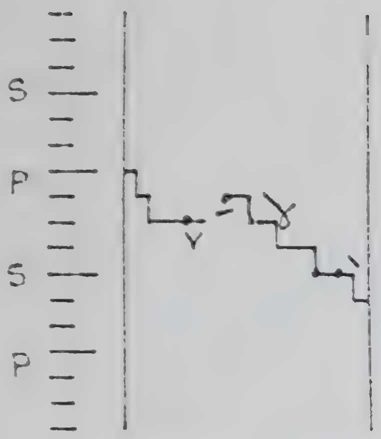
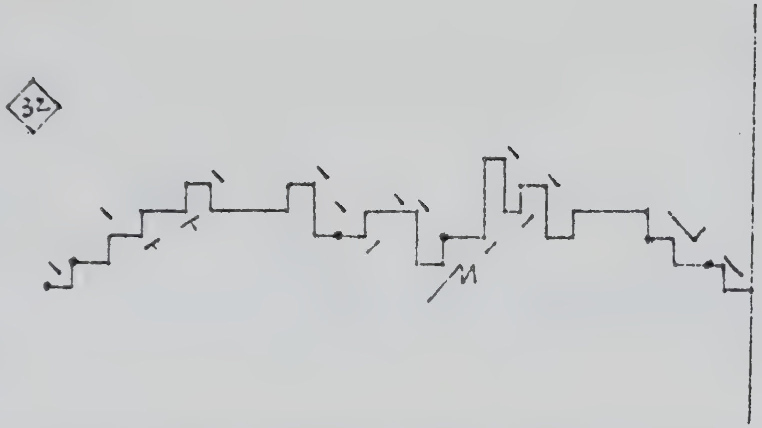

GM_P_DNDM MPDP DPMG R——G_M_D_P_
ta ra ra nana na ra ra na na
S
P
S
P


S
P
S
P
-MGG-MGRSSN
na na na na

32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tada na na na na

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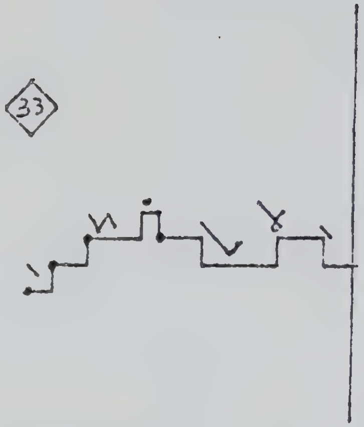
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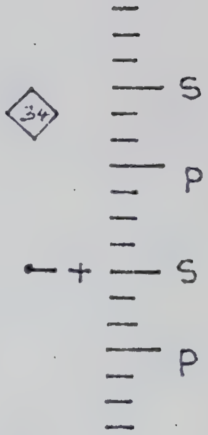
+
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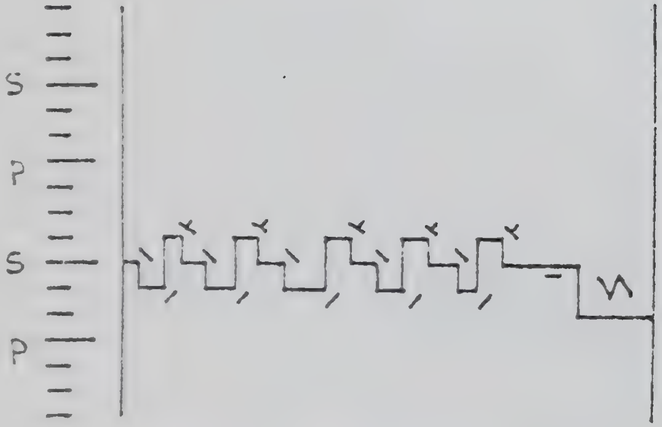
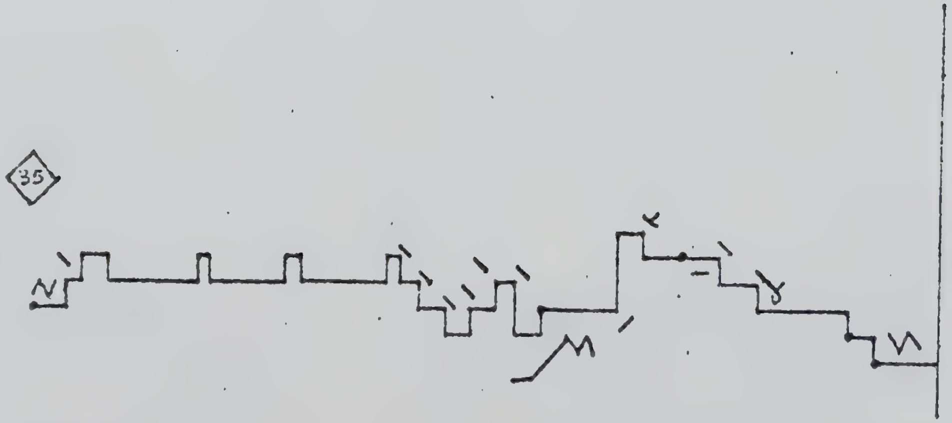
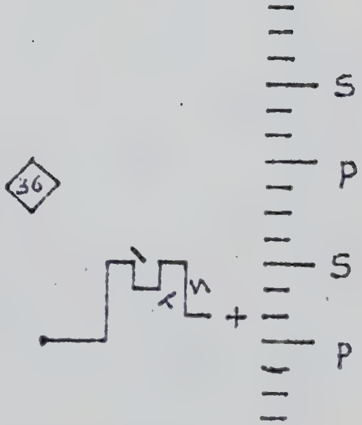
S
na

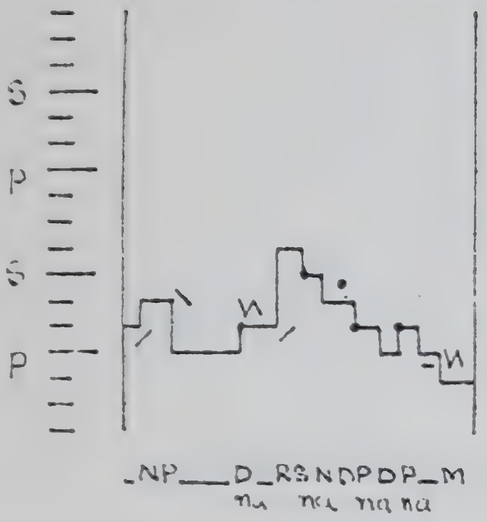

S
P
S
P
-NKSN RS N RSNRSNRS—D—

35

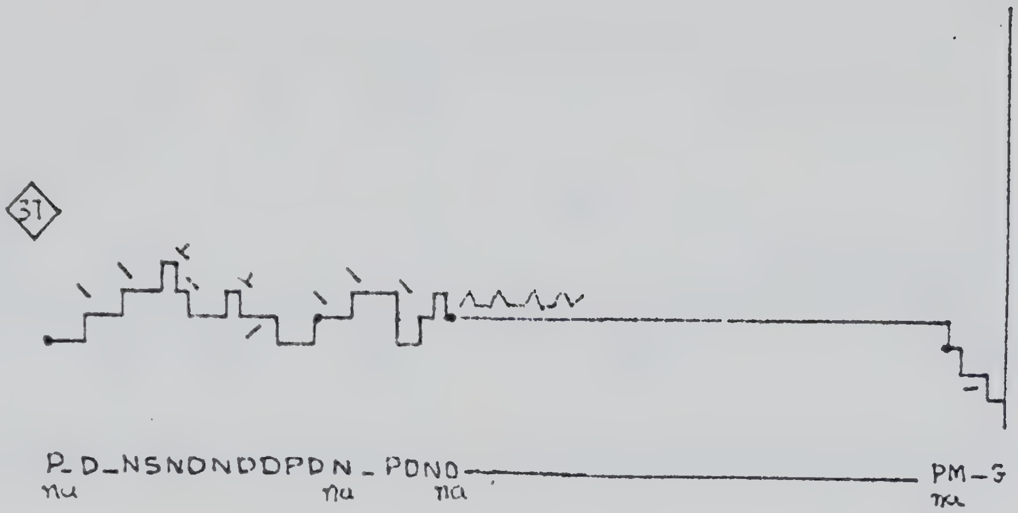

DNSN—SN—SN—SNDPDNPD—KSS-N-D—PM—
na na na ranu

36

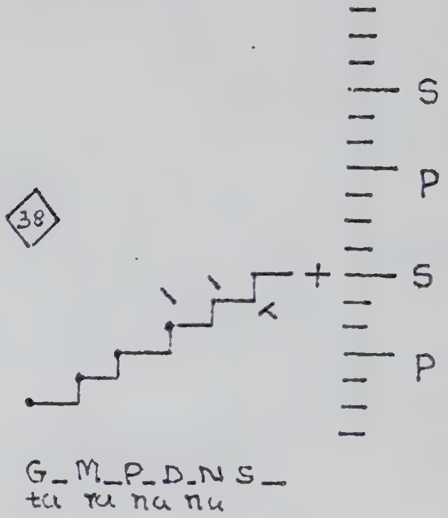

+
S
P
S
P
P—SNSD
na

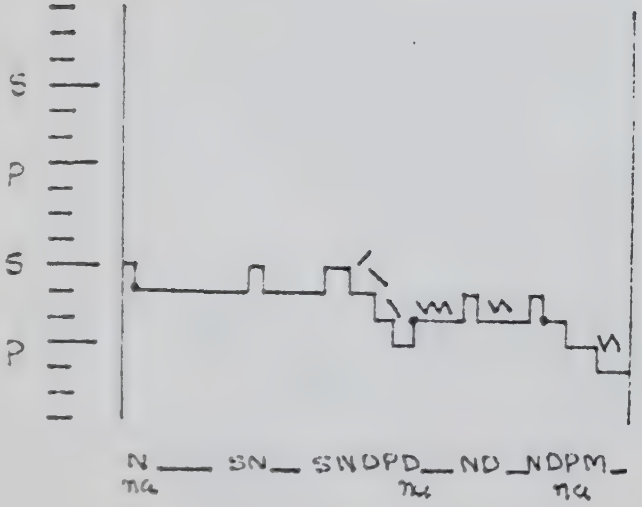

S
P
S
P
_NP___D_RSNDPDP_M
na na na na

37

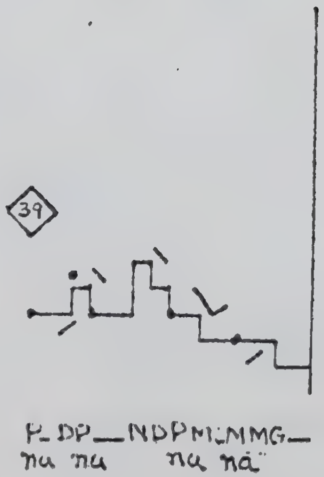

P_D_NSNDNDDPDN_PDND——PM_G
na na na na

38

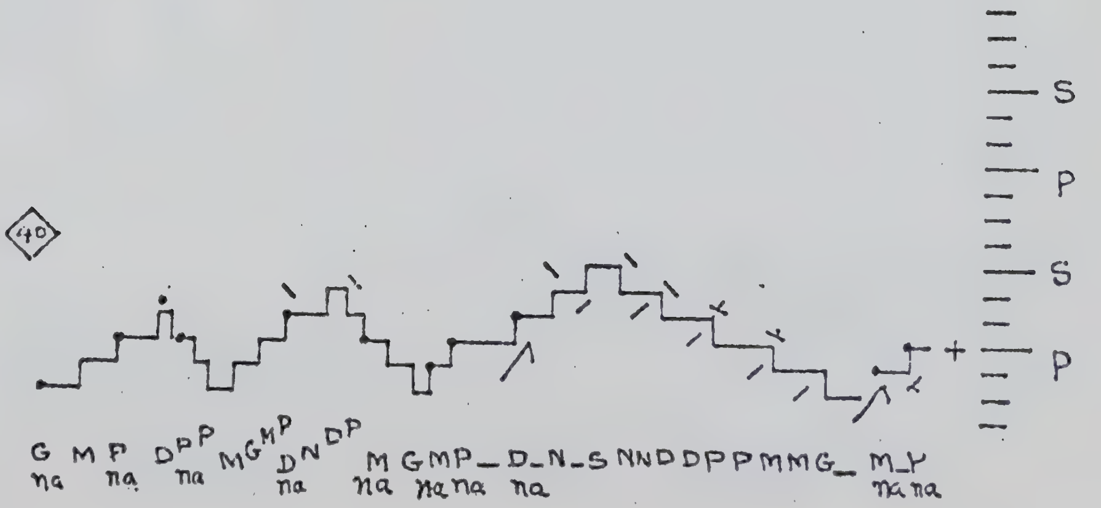

S
P
S
P
+
G_M_P_D_N S_
ta na na na

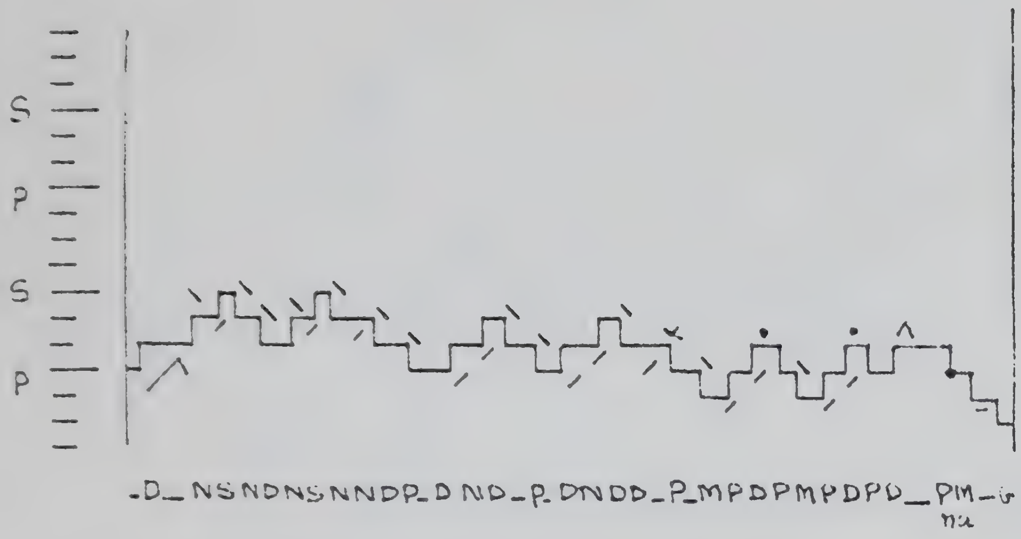

S
P
S
P
N___SN__SNDPD__ND_NDPM_
na na na

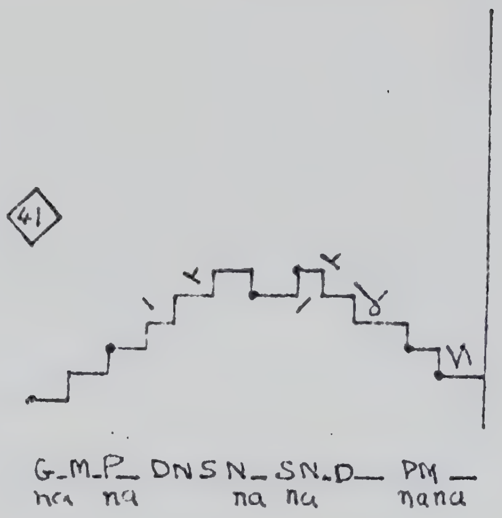
39

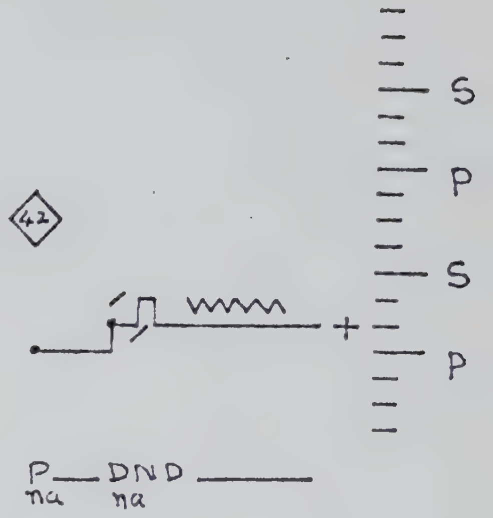

P_DP__NDPM_MMG—
na na na na

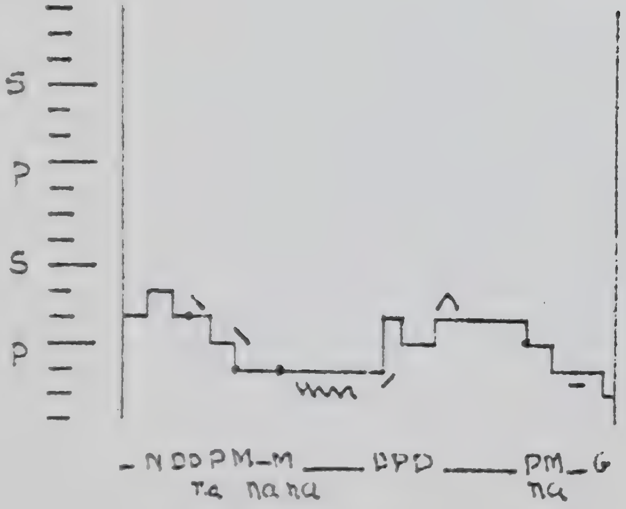
40

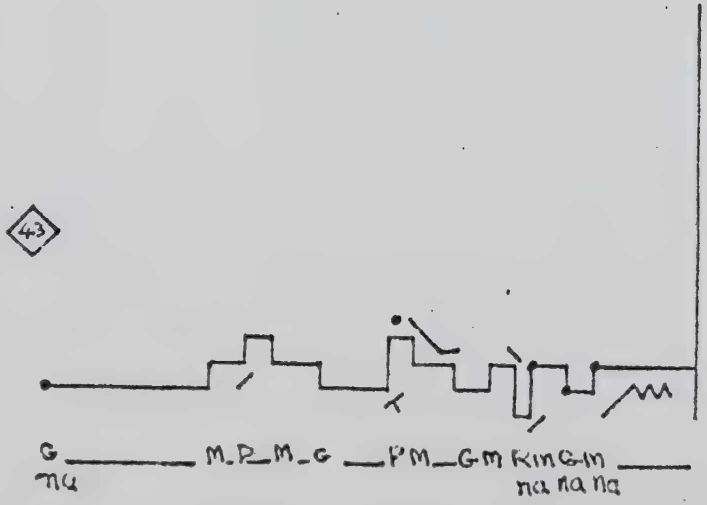

S
P
S
P
+
G M P D^P^P M G^M^P D^N D^P M G M P__D_N_S NNDDPPMMG__M_P
na na na na na na na na na na

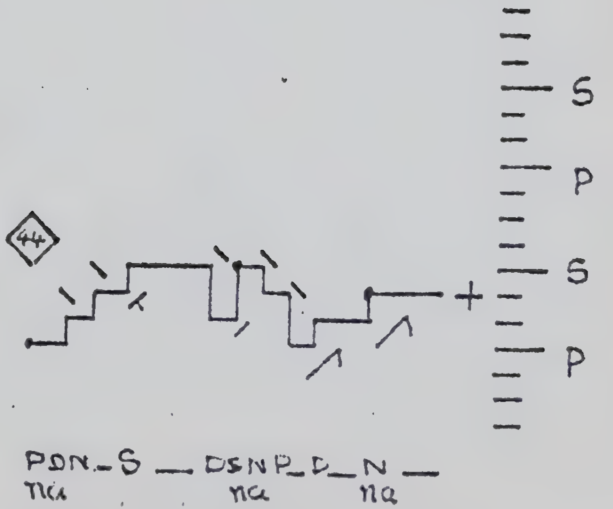

S
P
S
P
-D_NSNDNSNNDP_D ND_P_DNDD_P_MPDPMPDPD_PM_G
na

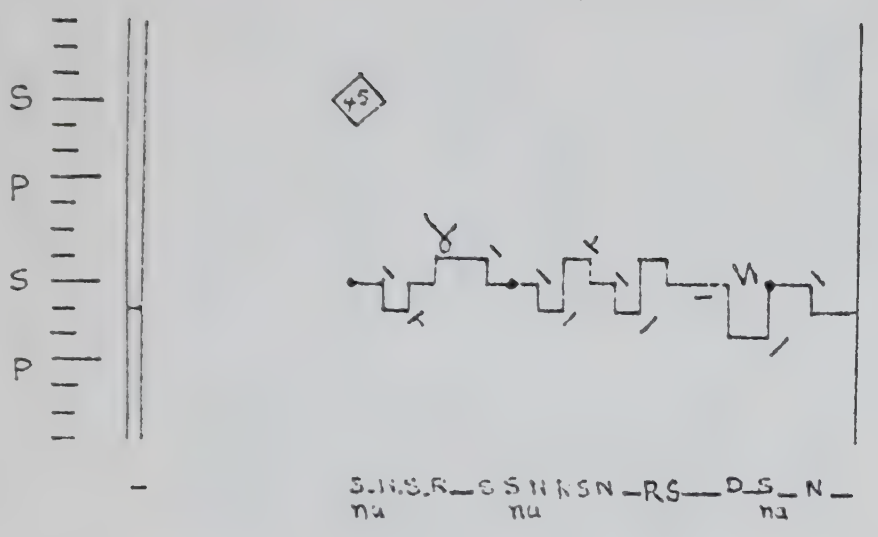

41
G_M_P_ DNSN_SN.D_ PM _
na na na na nana

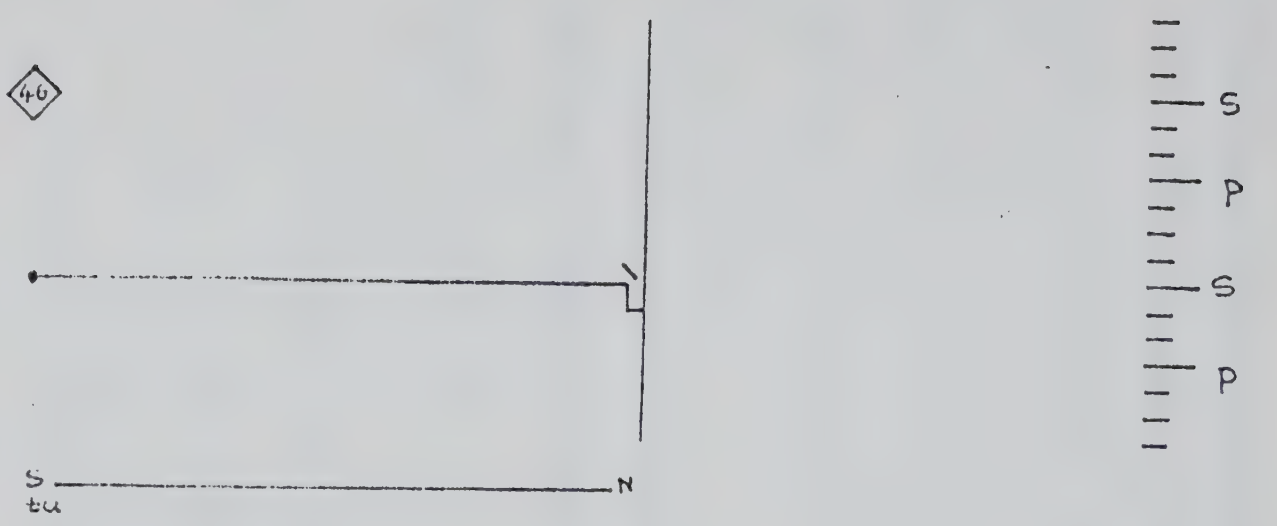

42
S
P
S
P
P___DND _______
na na


S
P
S
P
-NDDPM_M ____ PPD ____ PM_G
na na na na


43
G _______ M.P_M_G __PM_GmKinGm _____
na na na na


44
S
P
S
P
PDN_S __ DSNP_D_N __
na na na


45
S
P
S
P
S.N.S.R—SSNNSN—RS—D.S—N—
nu
nu
nu


46
S——N
tu
S
P
S
P

Performance: Rāga I, Performer 3

The total duration of the performance as it appears on the transcription is 281.5 seconds, of which the soloist occupies 209.2 seconds. Silence in the soloist's part occupies 72.3 seconds. There are 46 phrases in total. The range of this performance is from low Ri to high Ma (more than two octaves). This performance starts on middle Ga and ends on middle Sa.

The performer, T. Viswanathan, uses 25 types of ornaments, including gamakas, accents and stylistics, and some double ornaments. Seven type-A gamakas are used.

Aa1 is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

2nd on $\overset{\text{RS}}{\text{S}\_}$, $\overset{\text{GR}}{\text{R}\_}$, $\overset{\text{MG}}{\text{G}\_}$, $\overset{\text{PM}}{\text{M}\_}$, $\overset{\text{DP}}{\text{P}\_}$, $\overset{\text{ND}}{\text{D}\_}$, and $\overset{\text{SN}}{\text{N}\_}$;

3rd on $\overset{\text{GS}}{\text{S}\_}$, $\overset{\text{MR}}{\text{M}\_}$, $\overset{\text{PG}}{\text{G}\_}$, $\overset{\text{DM}}{\text{M}\_}$, $\overset{\text{NP}}{\text{P}\_}$, $\overset{\text{SD}}{\text{D}\_}$, and $\overset{\text{RN}}{\text{N}\_}$;

4th on $\overset{\text{PR}}{\text{R}\_}$ and $\overset{\text{SP}}{\text{P}\_}$.

Aa2 is used on tones Ri, Ma, and Da. The interval size is:

2nd (x2) on $\overset{\text{GRGR}}{\text{R}\_\_\_}$ and $\overset{\text{NDND}}{\text{D}\_\_\_}$;

3rd (x2) on $\overset{\text{SDSD}}{\text{D}\_\_\_}$ and $\overset{\text{PGPG}}{\text{M}\_\_\_}$.

Aa3 is used on tone Da only. The interval size is:

2nd (x3) on $\overset{\text{NDNDND}}{\text{D}\_\_\_\_\_}$;

3rd (x3) on $\overset{\text{SDSDSD}}{\text{D}\_\_\_\_\_}$.

Aa5 is used on tone Da only. The interval size is:

2nd (x6) on $\overset{\text{NDNDNDNDNDND}}{\text{D}\_\_\_\_\_\_\_\_\_\_\_}$.

Ab1 is used on tones Ri and Da. The interval size is:

3rd on $\overset{\text{MRM}}{\text{R}\_\_}$;

3rd and 2nd on $\overset{\text{SDN}}{\text{D}\_\_}$.

Ac4 is used on tone Ri only. The interval size is:

4th and 2nd (x3) on $\overset{\text{PRGRGRGR}}{\text{R}\_\_\_\_\_\_\_}$.

Af1 is used on tones Sa and Ma. The interval size is:

2nd and prime on $\overset{\text{RSS}}{\text{RS}\_}$ and $\overset{\text{PMM}}{\text{PM}\_}$.

Three type-B gamakas are used.

Ba1 is used on tones Ga and Ma. The interval size is:

2nd on $\overset{\text{GR}}{\text{G}\_}$ and $\overset{\text{MG}}{\text{G}\_}$.

Ba2 is used on tone Ga only. The interval size is:

2nd on $\overset{\text{GRG}}{\text{G}\_\_}$.

Ba3 is used on tone Ma only. The interval size is:

2nd (x5) on $\overset{\text{MGMGMGMGMG}}{\text{M}\_\_\_\_\_\_\_\_\_}$.

Six type-C gamakas are used.

Ca1 is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da and Ni.

The interval size is:

2nd on $\overset{\text{NS}}{\text{S}\_}$, $\overset{\text{SR}}{\text{R}\_}$, $\overset{\text{RG}}{\text{G}\_}$, $\overset{\text{GM}}{\text{M}\_}$, $\overset{\text{MP}}{\text{P}\_}$, $\overset{\text{PD}}{\text{D}\_}$, and $\overset{\text{DN}}{\text{N}\_}$;

3rd on $\overset{\text{DS}}{\text{S}\_}$, $\overset{\text{NR}}{\text{R}\_}$, $\overset{\text{RM}}{\text{M}\_}$, $\overset{\text{GP}}{\text{P}\_}$, $\overset{\text{MD}}{\text{D}\_}$, and $\overset{\text{PN}}{\text{N}\_}$;

4th on $\overset{\text{DR}}{\text{R\_}}$ and $\overset{\text{RP}}{\text{P\_}}$.

Cf1 is used on tones Ri, Ma, Da and Ni. The interval size is:

3rd and 2nd on $\overset{\text{SGR}}{\text{G\_\_}}$, $\overset{\text{GPM}}{\text{M\_\_}}$, $\overset{\text{PND}}{\text{D\_\_}}$ and $\overset{\text{DSN}}{\text{N\_\_}}$;

4th and 3rd on $\overset{\text{PSD}}{\text{D\_\_}}$.

Cf2 is used on tones Ri, Ma and Da. The interval size is:

3rd and 2nd (x2) on $\overset{\text{SGRGR}}{\text{R\_\_\_\_}}$ and $\overset{\text{GPMPM}}{\text{M\_\_\_\_}}$;

4th and 3rd (x2) on $\overset{\text{PSDSD}}{\text{D\_\_\_\_}}$.

Cf3 is used on tone Ri only. The interval size is:

3rd and 2nd (x3) on $\overset{\text{SGRGRGR}}{\text{R\_\_\_\_\_\_}}$.

Cg2 is used on tone Da only. The interval size is:

3rd and 2nd (x2) on $\overset{\text{PNDND}}{\text{D\_\_\_\_}}$.

Ch1 is used on tone Ma only. The interval size is:

3rd and prime on $\overset{\text{RMM}}{\text{M\_\_}}$.

Five type-D gamakas are used.

Da1 is used on tones Ga, Da and Ni. The interval size is:

2nd on $\overset{\text{GM}}{\text{M\_}}$, $\overset{\text{DN}}{\text{D\_}}$, and $\overset{\text{NS}}{\text{N\_}}$;

3rd on $\overset{\text{DS}}{\text{D\_}}$.

Da2 is used on tone Da only. The interval size is:

2nd (x2) on $\overset{\text{DNDN}}{\text{D\_\_\_}}$.

Dbl is used on tones Ga and Da. The interval size is:

2nd on $\overset{GMG}{G\_\_}$ and $\overset{DND}{D\_\_}$;

3rd on $\overset{DSD}{D\_\_}$.

Db2 is used on tone Da only. The interval size is:

3rd (x2) on $\overset{DSDSD}{D\_\_\_\_}$.

Del is used on tone Da only. The interval size is:

2nd (x5) on $\overset{DND\_DND\_DND\_DNDN}{D\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_}$.

Accent-E is used on tones Ga, Da, and Ni.

Accent-F is used on tones Sa, Ma, and Pa.

Stylistic-G is used on all seven tones Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

2nd on $\overset{RS}{S\_}$, $\overset{MG}{G\_}$, $\overset{PM}{M\_}$, $\overset{DP}{P\_}$, $\overset{ND}{D\_}$, and $\overset{SN}{N\_}$;

3rd on $\overset{GS}{S\_}$ and $\overset{MR}{R\_}$.

Stylistic-H is used on tones Sa, Ri, Ga, Ma, Pa, and Ni. The interval size is:

2nd on $\overset{NS}{S\_}$, $\overset{RG}{G\_}$, $\overset{GM}{M\_}$, $\overset{MP}{P\_}$, and $\overset{DN}{N\_}$;

3rd on $\overset{NR}{R\_}$ and $\overset{GP}{P\_}$.

Double ornaments are used on six tones Ri, Ga, Ma, Pa, Da, and Ni.

Table 4.7 shows that a total of 883 tones were used by the performer, of which 45% received some kind of ornament and 55% had no ornament. Of the 883, 35% were tones with gamaka, 2% were tones with

Table 4.7
Percentage Distribution of Tones and Gamakas:
Rāga I, Performer 3

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(22)	16	(3)	2	(20)	14	(2)	2	(47)	34	(94)	66	100%	(141)
Ri	(63)	60			(3)	3			(66)	63	(39)	37	100%	(105)
Ga	(14)	11	(4)	3	(15)	12			(33)	26	(93)	74	100%	(126)
Ma	(35)	27	(5)	4	(5)	4			(45)	35	(85)	65	100%	(130)
Pa	(18)	15	(1)	1	(8)	7	(1)	1	(28)	23	(95)	77	100%	(123)
Da	(79)	74	(1)	1	(3)	3	(4)	4	(87)	81	(25)	19	100%	(112)
Ni	(75)	51	(1)	1	(13)	9			(89)	61	(57)	39	100%	(146)
Total	(306)	35	(15)	2	(67)	7	(7)	1	(395)	45	(48)	55	100%	(883)

accent, 7% were tones with stylistic, and 1% were tones with double ornament.

The tone Da is the most ornamented (81%) and the tones Ri and Ni are ornamented more than half of the time (63% Ri and 61% Ni). The tones Ga and Pa are ornamented approximately one quarter of the time (26% Pa and 23% Ga). The tones Sa and Ma are ornamented 34% and 35% respectively.

In Table 4.8, it can be seen that types Aal, Cal, and stylistics account for a larger proportion of ornaments than any other types (37.4% Aal, 15.9% Cal and 16.9% stylistics). Some tones receive more of a given gamaka than do others. Of the total 148 type Aal, the tones Ri and Ma, Sa and Ni, Pa and Da receive 13, 10 and 7 respectively. Of the stylistics, tones Sa, Ga, and Ni receive more than any other tones (20, 15, and 13 respectively).

More varieties of type-A gamakas occur on tones Ri and Da than on other tones; more type-C gamakas on tones Ri, Ma, and Da; more type-D on tone Da; and type-B is used rarely on two tones (Ga and Ma). Accent-E and accent-F are evenly used but spread over several tones (Accent-E on tones Ga, Da, and Ni; accent-F on tones Pa, Da, and Ni). Stylistic-G is used more than stylistic-H (40 and 27 respectively). Double ornaments are found on tones Sa, Pa, and Da.

Table 4.9 shows that of the total 882 tones, 2% are held tones. All tones except Ni are held tones. The tone Ga is found in low, middle, and high range; and tone Da is found in low range only. Among the held tones, Ga has the highest percentage (4%), next is tone Pa (3%), next Da and Ma (2%), and Sa and Ri are the same (1%).

Table 4.8

Joint Distribution of Tones and Gamakas:
Rāga I, Performer 3

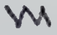
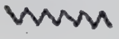
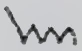
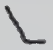
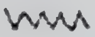
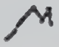
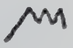
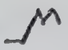
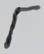
Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Aa1		5	24	3	6	11	37	62	148	37.4
a2			9		5		7		21	5.3
a3							1		1	.3
a5							1		1	.3
b1			10				5		15	3.8
c4			1						1	.3
f1		7			3				10	2.5
Ba1				1	1				2	.5
a2				3					3	.8
a3					2				2	.5
Ca1		10	13	3	13	7	7	10	63	15.9
f1			4		1		10	2	17	4.3
f2			1		3		1		5	1.3
f3			1						1	.3
g2							1		1	.3
h1					1				1	.3
Da1				1			2	1	4	1.0
a2							1		1	.3
b1				3			4		7	1.8

Table 4.8 (Continued)

Joint Distribution of Tones and Gamakas: Rāga I, Performer 3

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
b2	ʌʌ						1		1	.3
e1	ʌʌʌʌ						1		1	.3
Gamaka Total		22	63	14	35	18	80	75	307	77.7
E	•			4			1	1	6	1.5
F	–	3			5	1			9	2.3
Accent Total		3		4	5	1	1	1	15	3.8
G	Y	7	1	8	3	7	3	11	40	10.1
H	λ	13	2	7	2	1		2	27	6.8
Stylistic Total		20	3	15	5	8	3	13	67	16.9
Double Ornaments		2				1	4		7	1.8
Grand Total		47	66	33	45	28	87	89	395	100.2*

Table 4.9

Distribution of Held Tones: Rāga I, Performer 3

Tone	Frequency of Tones	Range						Total	%
		Low		Middle		High			
		Unornamented	Ornamented	Unornamented	Ornamented	Unornamented	Ornamented		
Sa	141			1			1	2	1
Ri	105				1			1	1
Ga	126	1		1		2	1	5	4
Ma	130				2			2	2
Pa	123			4				4	3
Da	112		2					2	2
Ni	145								
Total	882	1	2	6	3	2	2	16	2

Summary

The performers 1, 2 and 3 in Rāga I Shankarābharana ornament 74%, 70% and 45% of all tones respectively; the other tones are unornamented. Of the ornamented tones, Ri, Da, and Ni are ornamented most frequently. The tones Ma, Pa, and Ga are the next highest. The tone Sa is ornamented least often.

All three performers use Aal, Cal, and stylistics more than any other ornament type. Aal is used mostly on tones Ri, Da, and Ni; Aa2 is used by all the performers on tones Ri, Ma, and Da only. Cal occurs mostly on tones Sa, Ri, Ma, Pa, Da, and Ni. Except for tone Da, the rest of the tones occur mostly with stylistics.

Although all the performers use more of type-A, type-C and stylistic-G than type-B, type-C and stylistic-H, there are different varieties of gamaka of type-B and type-D used on different tones by the three performers. For example, only performer 3 uses Ba3 (on Ma), Db2 (on Ma), and Del (on Da). Dhl is used only by performer 2 (on Da).

It is apparent that tones Ri, Da, Ni, and Ma are most important for ornamentation in Rāga Shankarābharana because all three performers agree in giving certain ornaments to these tones. Also, it can be seen that each performer uses a few types of ornaments unique within this corpus which reveals an individual style. The tones Sa, Ga and Pa are held most by all three performers. The performances start on middle Sa or Ga and all end on Sa (middle Sa or high Sa).

CHAPTER V

GAMAKAS IN RĀGA II: PŪRVIKALYĀNI

Rāga Pūrvikalyāni

The rāga Pūrvikalyāni is a janya rāga, derived from Gamanāsrama which is rāga 53 in the 72-melakarta system. It was called Gamakakriya in the asampūrna mela system of rāgas; at present it is popularly known as Pūrvikalyāni. Within the Karnatic tradition, it is believed that this rāga evokes a mood of solitude and detachment from the world.

Pūrvikalyāni is an ārōhana vakra varja sampūrna rāga--in ascent it is 'crooked' and Ni is not used; in descent all seven tones are present. The tonal inventory is: Shadja (Sa), Sudha Rishabha (Ri_2), Antara Gandhara (Ga_2), Prati Madhyama (Ma_2), Panchama (Pa), Chatuśruti Dhaivata (Da_2), and Kākili Nishādha (Ni_2).

Figure 5.1

Rāga II: Pūrvikalyāni in
Solfège and Staff Notation

Sa $\underset{\wedge\!\!\!\vee}{Ri_1}$ $\overset{\wedge}{Ga_2}$ $\overset{\backslash}{Ma}$ Pa $\overset{\backslash}{Da_2}$ $\overset{\vee}{Pa}$ $\underset{/}{Sa}$

Sa $\overset{\backslash}{Ni_2}$ $\overset{\backslash}{Da_2}$ Pa $\overset{\backslash}{Ma_2}$ $\overset{\backslash}{Ga_2}$ $\overset{\backslash}{Ri_1}$ Sa

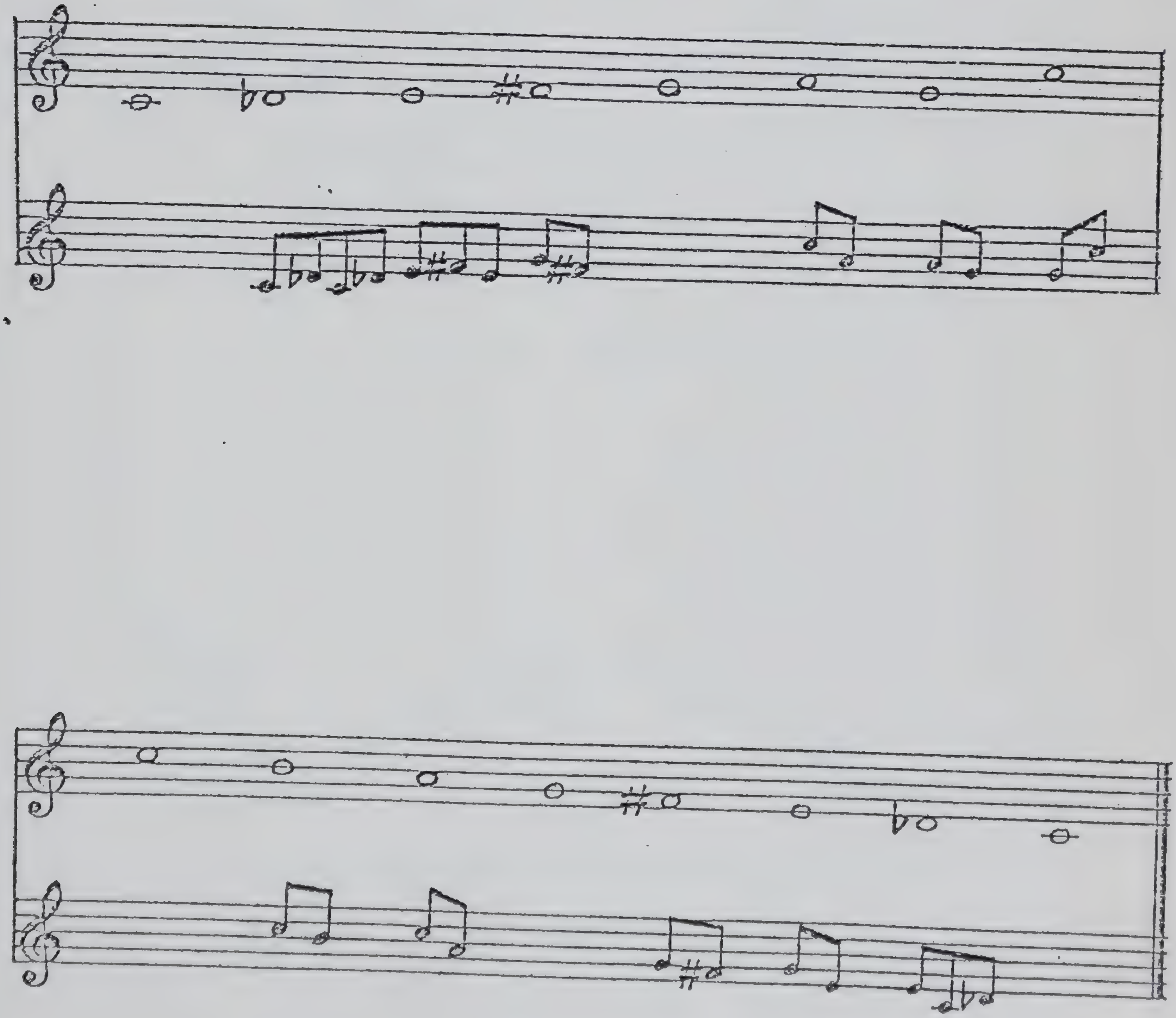
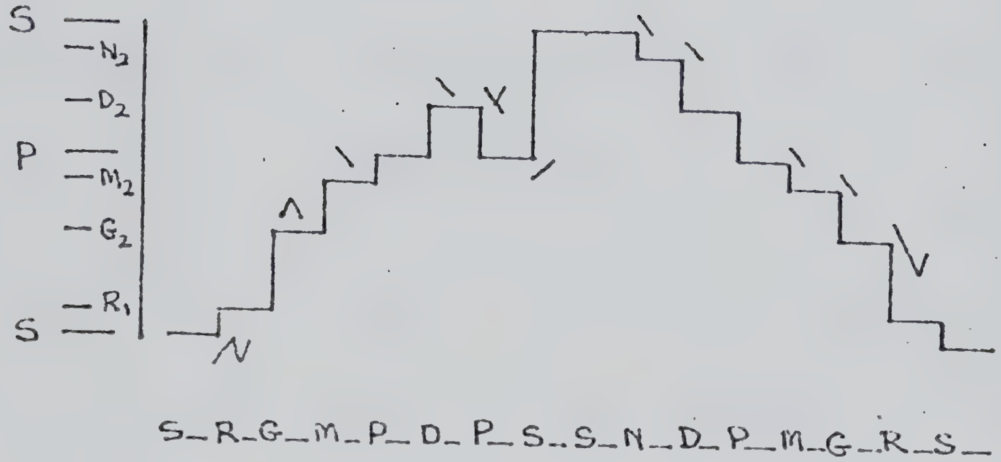
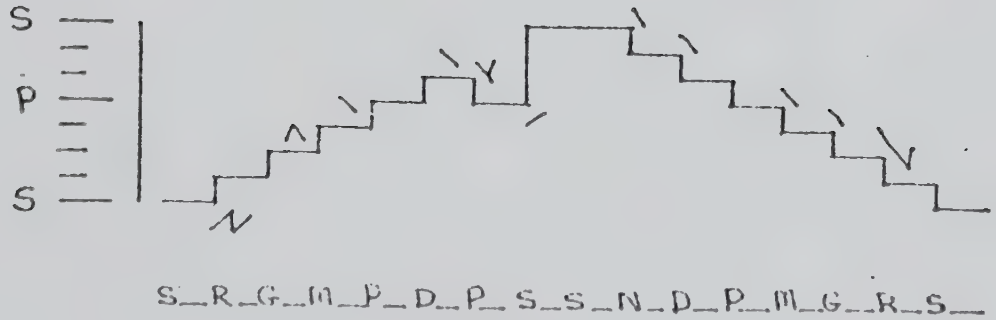


Figure 5.2

Rāga II: Pūrvikalyāni in Graph


S
N₂
D₂
P
M₂
G₂
R₁
S
S_R_G_M_P_D_P_S_S_N_D_P_M_G_R_S_

By Interval Size


S
P
S
S_R_G_M_P_D_P_S_S_N_D_P_M_G_R_S_

By Scale Step

Rāga II, Performer 1

Principal Melody: Female Singer

Performer: M. S. Subbulakshmi

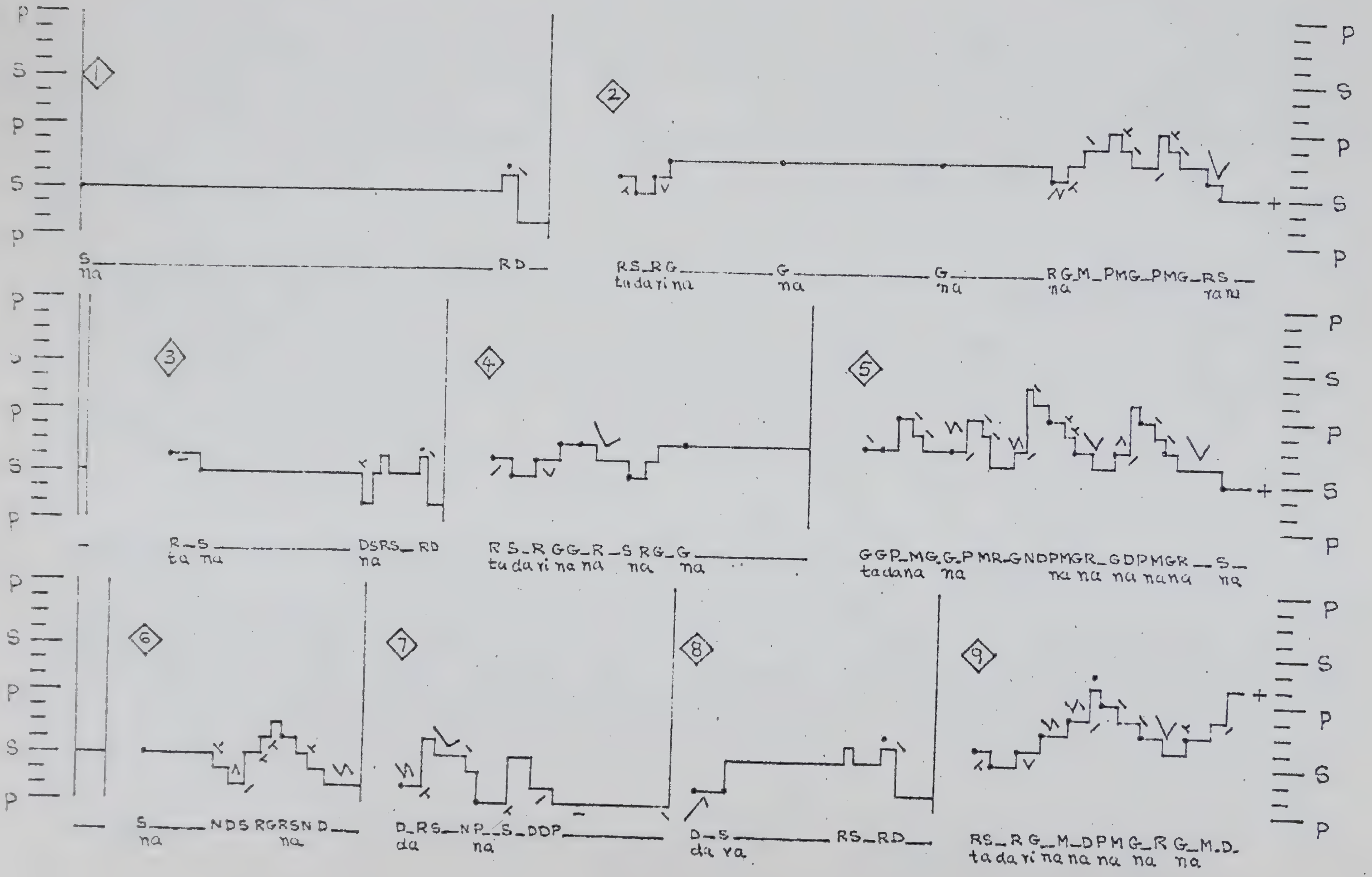
Melodic Accompaniment: Violin

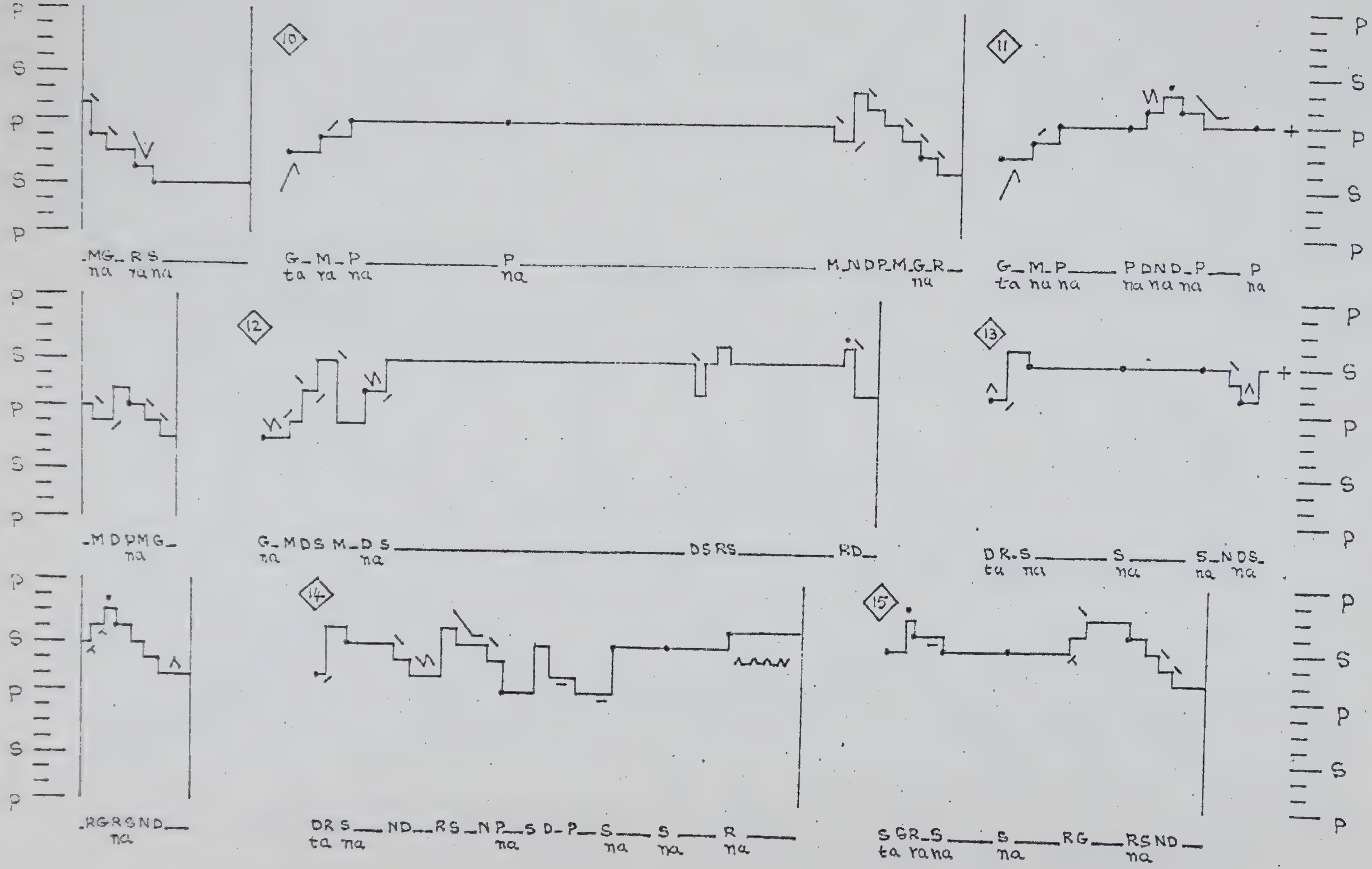
Drone Accompaniment: Tambūra

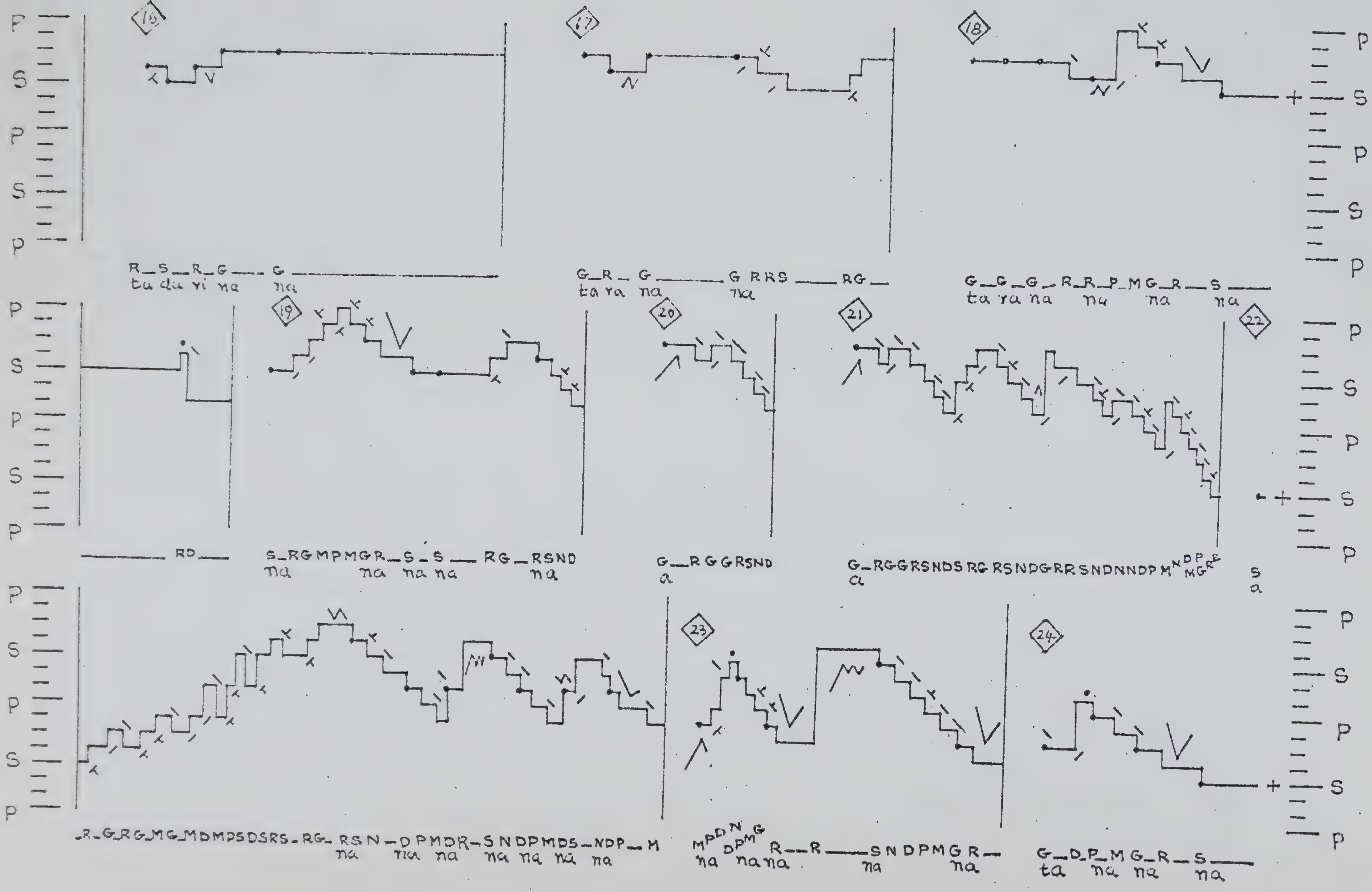
Performance Duration: 2 minutes, 23.2 seconds

Disc Source: CONCERT ALBUM
Odeon S/MOAE 5012

Extract From:
- Kriti: "Meenakshi me mudam"
- Rāga: Purvi Kalyani
- Tāla: Ādi
- Language: Sanskrit
- Composer: Muthusvami Dikshitar


P
S
P
S
P
1
S — RD —
na
2
RS_RG — G — G — RG M_PMG_PMG_RS —
tadarina na na na rana
3
R_S — DSRS_ RD
ta na na
4
RS_RGG_R_S RG_G —
tadarinana na na
5
GGP_MG G_P MR_GNDPMGR_GDPMGR — S —
tadana na na na na nana na
6
S — NDS RGRSN D —
na na
7
D_RS — NP — S_DDP —
da na
8
D_S — RS_RD —
da ra
9
RS_RG — M_DPMG_R G_M_D.
tadarinana na na na
+


P S P S P
10
11
.MG_RS
na rana
G_M_P
ta ra na
P
na
M_NDP_M_G_R_
na
G_M_P
ta na na
PDND_P
na na na
P
na
12
13
MDPMG
na
G_MDS M_DS
na na
DSRS
RD_
DR.S
ta na
S
na
S_NDS_
na na
14
15
.RGRSND_
na
DRS
ta na
ND
RS
NP
na
S D-P
S
na
S
na
R
na
S GR_S
ta rana
S
na
RG
RSND
na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17
18
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ta ra na
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na
RG
G_G_G_R_R_P_MG_R_S
ta ra na na na na
19
20
21
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RD
S_RGMPMGR_S_S
na na na na
RG_RSND
na
G_RGGRSND
a
G_RGGRSNDSRGRSNDGRRSNDNNDPM^{NDP}MGR^{E}
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24
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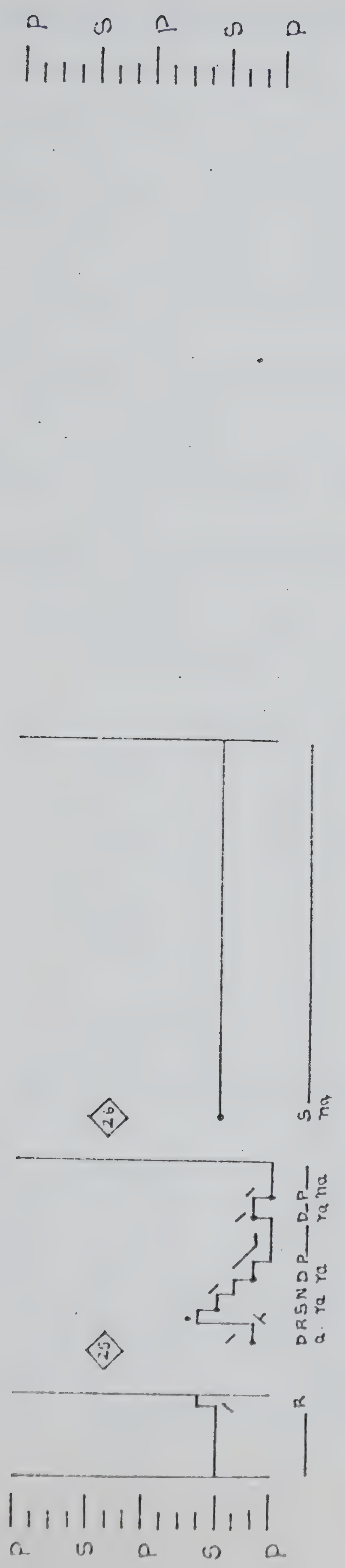
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Performance: Rāga II, Performer 1

The total duration of the performance as it appears on the transcription is 143.2 seconds, of which the soloist occupies 121.4 seconds. Silence in the soloist's part, during which the accompaniment continues, occupies 21.8 seconds. There are 26 phrases in total. The range of this performance is from low Pa to high Pa (two octaves). This performance starts and ends on middle Sa.

The performer, M. S. Subbulakshmi, uses 17 types of ornaments, including gamakas, accents and stylistics, and some double ornaments. Four type-A gamakas are used.

Aa1 is used on six tones, Ri, Ga, Ma, Pa, Da and Ni. The interval size is:

2nd on $\overset{GR}{R\_}$, $\overset{MG}{G\_}$, $\overset{PM}{M\_}$, $\overset{DP}{P\_}$, $\overset{ND}{D\_}$ and $\overset{SN}{N\_}$;

3rd on $\overset{MR\_}{R\_}$, $\overset{DM\_}{M\_}$, and $\overset{SD}{D\_}$;

4th on $\overset{RD}{D\_}$;

5th on $\overset{SM}{M\_}$.

Aa2 is used on tones Ga, Ma and Da. The interval size is:

2nd (x2) on $\overset{MGMG}{G\_\_\_}$, $\overset{PMPM}{M\_\_\_}$, and $\overset{NDND}{D\_\_\_}$;

3rd (x2) on $\overset{SDSD}{D\_\_\_}$.

Ac1 is used on tone Ri only. The interval size is:

3rd and 2nd on $\overset{GSR}{R\_\_}$.

Af1 is used on tones Sa, Ri, and Pa. The interval size is:

2nd and prime on $\overset{\text{RSS}}{\text{RS\_}}$, $\overset{\text{GRR}}{\text{GR\_}}$ and $\overset{\text{DPP}}{\text{DP\_}}$.

Two type-B gamakas are used.

Ba1 is used on tone Pa with accent-F as a double ornament.

The interval size is:

2nd on $\overset{\text{PM}}{\text{P\_}}$.

Ba2 is used on tone Ri only. The interval size is:

2nd on $\overset{\text{RSR}}{\text{R\_\_}}$.

Five type-C gamakas are used.

Ca1 is used on all seven tones. The interval size is:

2nd on $\overset{\text{SR\_}}{\text{R\_}}$, $\overset{\text{RG\_}}{\text{G\_}}$, $\overset{\text{GM\_}}{\text{M\_}}$, $\overset{\text{MP\_}}{\text{P\_}}$, $\overset{\text{PD}}{\text{D\_}}$, and $\overset{\text{DN}}{\text{N\_}}$;

3rd on $\overset{\text{DS}}{\text{S\_}}$, $\overset{\text{SG\_}}{\text{G\_}}$, $\overset{\text{GP}}{\text{P\_}}$, and $\overset{\text{MD}}{\text{D\_}}$;

4th on $\overset{\text{PS\_}}{\text{S\_}}$, $\overset{\text{DR\_}}{\text{R\_}}$, $\overset{\text{RP\_}}{\text{P\_}}$, $\overset{\text{GD}}{\text{D\_}}$, and $\overset{\text{MN}}{\text{N\_}}$;

5th on $\overset{\text{DG}}{\text{G\_}}$ and $\overset{\text{GN}}{\text{N\_}}$.

Ca2 is used on tone Ri only. The interval size is:

2nd (x2) on $\overset{\text{SRSR}}{\text{R\_\_\_}}$.

Cc1 is used on tone Ri only. The interval size is:

4th and 2nd (x2) on $\overset{\text{DRSRSR}}{\text{R\_\_\_\_\_}}$.

Ce1 is used on tone Ri. The interval size is:

2nd (x4), Prime, and 2nd on $\overset{\text{SRS\_RS\_RSSR}}{\text{R\_\_\_\_\_\_\_\_\_\_}}$.

Cf1 is used on tones Ga, Ma, and Da. The interval size is:

3rd and 2nd on $\overset{RMG}{G\_\_}$ and $\overset{GPM}{M\_\_}$;

4th and 3rd on $\overset{PSD}{D\_\_}$;

6th and 2nd on $\overset{DMG}{G\_\_}$.

Two type-D gamakas are used.

Da1 is used on tone Ma only. The interval size is:

2nd on $\overset{MP}{M\_}$.

Db1 is used on tones Ga and Da. The interval size is:

2nd on $\overset{GMG}{G\_\_}$ and $\overset{DND}{D\_\_}$.

Accent-E is used on tones Ri, Ga and Ni.

Accent-F is used on tones Ri, Pa and Da.

Stylistic-G is used on all seven tones, Sa, Ri, Ga, Ma, Pa, Da, and Ni.

The interval size is:

2nd on $\overset{RS\_}{S\_}$, $\overset{GR\_}{R\_}$, $\overset{MG\_}{G\_}$, $\overset{PM\_}{M\_}$, $\overset{DP\_}{P\_}$, $\overset{ND}{D\_}$, and $\overset{SN}{N\_}$.

3rd on $\overset{SD}{D\_}$.

Stylistic-H is used on six tones, Sa, Ri, Ga, Ma, Pa, and Da. The interval size is:

2nd on $\overset{SR\_}{R\_}$, $\overset{RG\_}{G\_}$, $\overset{GM\_}{M\_}$, $\overset{MP}{P\_}$ and $\overset{DN\_}{N\_}$;

3rd on $\overset{DS}{S\_}$ and $\overset{MD}{D\_}$;

4th on $\overset{PS}{S\_}$ and $\overset{DR}{R\_}$.

Double ornaments are used on four tones, Ri, Ga, Pa, and Da.

Table 5.1 shows that a total of 335 tones were used by the performer, of which 70% received some kind of ornament and 30% had no ornament. Of the 335, 50% were tones with gamaka, 4% were tones with accent, 15% were tones with stylistic, and 1% were tones with double ornament.

The tone Ma is almost always ornamented (97% Ma). The tones Da, Ri and Ni are the next highest (89% Da, 86% Ri, and 84% Ni). The tone Ga is between these two extremes (74% Ga). The tone Sa is the least ornamented tone (23% Sa). The tone Pa is ornamented twice as much as the tone Sa (44% Pa). In comparison to other tones, Sa and Pa are the least ornamented tones.

In Table 5.2, it can be seen that types Aal, Cal and stylistics account for a larger proportion of ornaments than any other types (35% Aal, 14.1T Cal, and 20.9% stylistics). Some tones receive more of a given gamaka than do others. Of the total 82 type Aal, the tones Da, Ma, and Ga receive 22, 19, and 18 respectively. Of the total 33 type Cal the tones Ri and Ga receive the highest number (9 and 7); the other 17 are spread over the rest of the other tones. Of the stylistics, tones Ri, Sa, Ga, and Ma receive more than any other tones (13 and 8 respectively).

More varieties of type-A gamakas occur on tones Ri, Ga, Ma, Pa, and Da than on Sa or Ni; more type-C on tone Ri; type-B on tone Ri only; and type-D on tones Ga, Ma, and Da. Accent-E is used on tones Ri, Ga, and Ni (most on Ri: 8). Accent-F is used on tones Ri, Pa, and Da. Stylistic-G is used on all seven tones but more on tone Ma. Stylistic-H is used on all tones except Ni, but more on tone Ri. Double ornaments are found on tones Ri, Ga, Pa and Da. Table 5.3 shows that of the total

Table 5.1
Percentage Distribution of Tones and Gamakas: Rāga II, Performer 1

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(6)	10			(8)	13			(14)	23	(46)	77	100%	(60)
Ri	(40)	56	(7)	10	(13)	18	(1)	2	(61)	86	(10)	14	100%	(71)
Ga	(35)	57	(1)	2	(8)	13	(1)	2	(45)	74	(16)	26	100%	(61)
Ma	(25)	73			(8)	24			(33)	97	(1)	3	100%	(34)
Pa	(7)	22	(1)	3	(5)	16	(1)	3	(14)	44	(18)	56	100%	(32)
Da	(39)	75	(1)	2	(4)	8	(2)	4	(46)	89	(6)	11	100%	(52)
Ni	(16)	64	(2)	8	(3)	12			(21)	84	(4)	16	100%	(25)
Total	(168)	50	(12)	4	(49)	15	(5)	1	(234)	70	(101)	30	100%	(335)

Table 5.2

Joint Distribution of Tones and Gamakas:
Rāga II, Performer 1

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Aa1	\		10	18	19	1	22	12	82	35.0
a2	ʌ/			5	1		6		12	5.1
c1	\/		10						10	4.2
f1	L	2	1			3			6	2.6
Ba1	\	(in double ornament only)								
a2	v		4						4	1.7
Ca1	/	4	9	7	1	3	5	4	33	14.1
a2	/ʌ/		3						3	1.2
c1	/ʌʌ		2						2	.9
e1	ʌʌʌʌ		1						1	.4
f1	/\			4	1		1		6	2.6
Da1	/				3				3	1.3
b1	ʌ			1			5		6	2.6
Gamaka Total		6	40	35	25	7	39	16	168	71.8
E	•		5	1				2	8	3.4
F	_		2			1	1		4	1.7
Accent Total			7	1		1	1	2	12	5.1

Table 5.2 (Continued)

Joint Distribution of Tones and Gamakas: Rāga II, Performer 1

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
G	ɣ	4	1	5	7	3	3	3	26	11.1
H	ʎ	4	12	3	1	2	1		23	9.8
Stylistic Total		8	13	8	8	5	4	3	49	20.9
Double Ornaments			1	1		1	2		5	2.1
Grand Total		14	61	45	33	14	46	21	234	99.8*

Table 5.3

Distribution of Held Tones: Rāga II, Performer 1

Tone	Frequency of Tones	Range						Total	%
		Low		Middle		High			
		Unornamented	Ornamented	Unornamented	Ornamented	Unornamented	Ornamented		
Sa	60			5		4	1	10	17
Ri	71								
Ga	61			4		2		6	10
Ma	34								
Pa	32		1	2				3	9
Da	52								
Ni	25								
Total	335		1	11		6	1	19	6

335 tones, 6% are held tones. The held tones are Sa, Ga, and Pa. The tones Sa and Ga are found in both middle and high range; the tone Pa in both low and middle range. Among the held tones, Sa has the highest percentage (10%); next are tones Ga (6%) and Pa (3%).

Rāga II, Performer 4

Principal Melody: Male Singer

Performer: Ariyakudi Ramanuja Iyengar

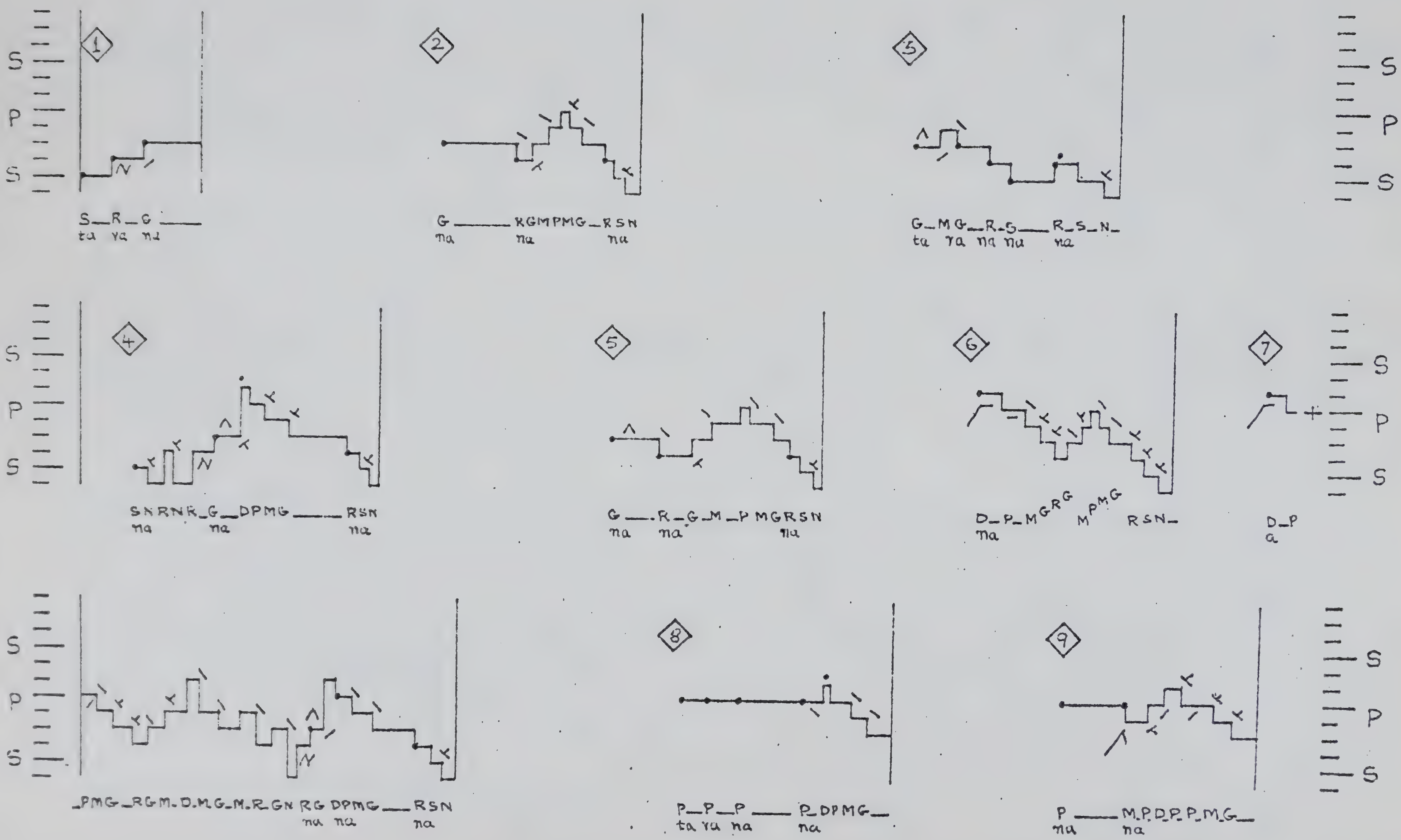
Melodic Accompaniment: Violin

Drone Accompaniment: Tambūra

Performance Duration: 2 minutes, 19.5 seconds

Tape Source: Private Recording made in India obtained from Ranganayaki Ayyangar

Extract From:
- Kriti: "jnānamu sakarāda"
- Rāga: Pūrvikalyāni
- Tāla: Ādi
- Language: Telugu
- Composer: Tygaraja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P
S
1
S_R_G_
ta ya na
2
G_KGMPMG_RSN
na na na
3
G_MG_R-S_R_S_N_
ta ya na na na
S
P
S
4
SNRNK_G_DPMG_RSN
na na na
5
G_.R_G_M_P MGRSN
na na na
6
D_P_M$^{GR^G}$ M$^{P^{M^G}}$ RSN_
na
7
D_P
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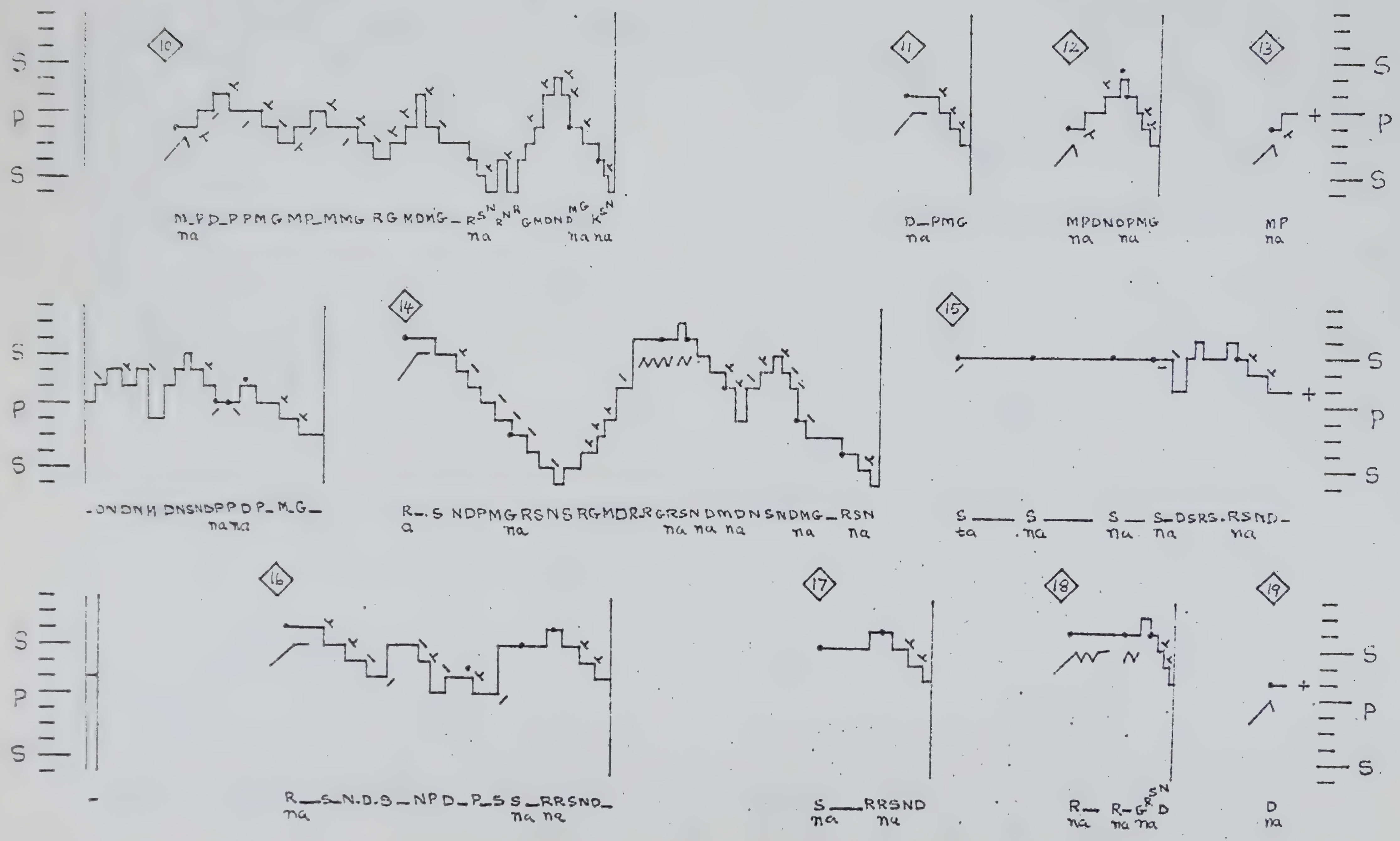
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11
D_PMG
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MPDNDPMG
na na
13
+
MP
na
-DNDNH DNSNDPPDP_M_G_
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14
R-.S NDPMGRSNSRGMDRRGRSNDMDNSNDMG_RSN
a na nana na na na
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ta .na na na na
16
R__S_N.D.S_NPD_P_SS_RRSND_
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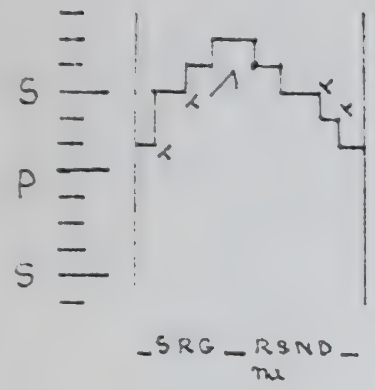
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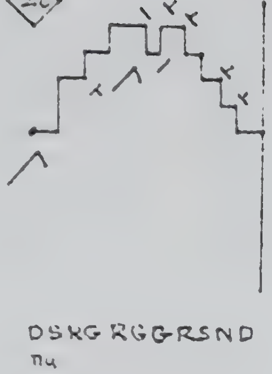
20


DSRG RGGRSND
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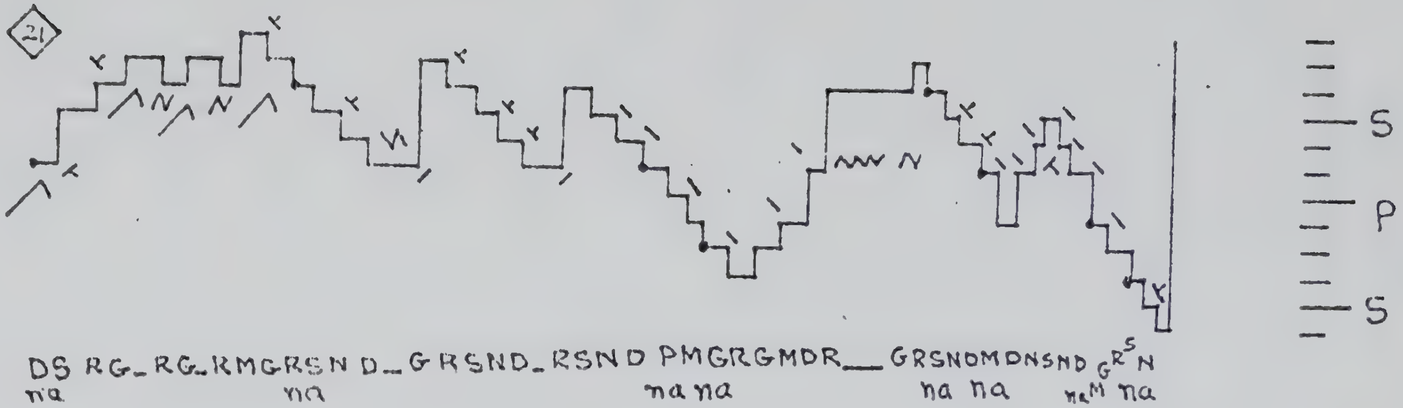
21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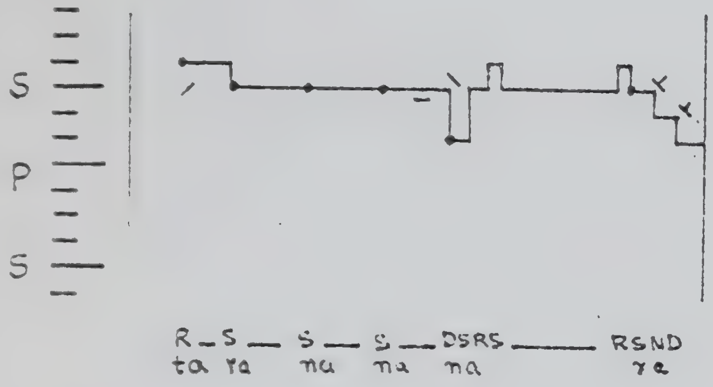
22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R_S__ S__ S__DSRS______ RSND
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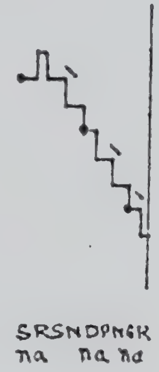
23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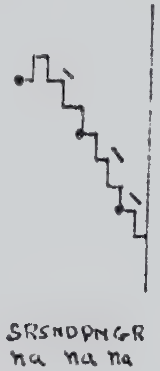
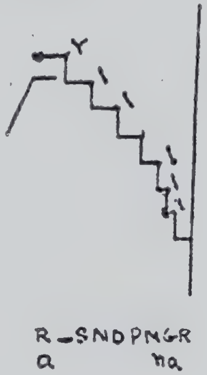
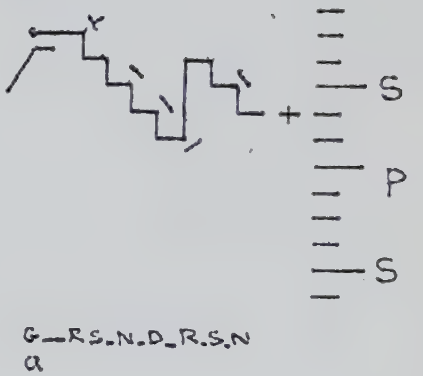
24


SRSNDPNGR
na na na

25


R_SNDPNGR
a na

26


+
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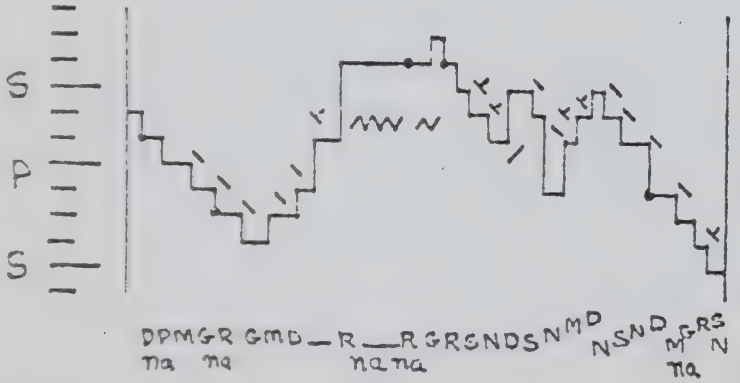
G_RS.N.D_R.S.N
a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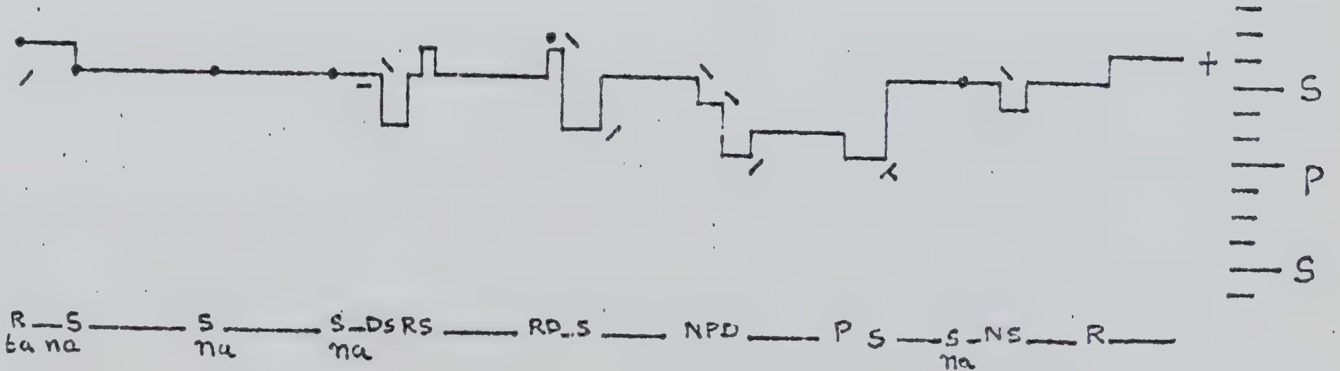
DPMGR GMD_R__RGRSNDSNMD NSND MGRS N
na na na na na

27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R_S______ S______ S_DSRS _____ RD_S _____ NPD _____ P S __S_NS___ R____
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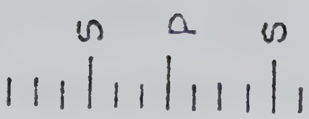
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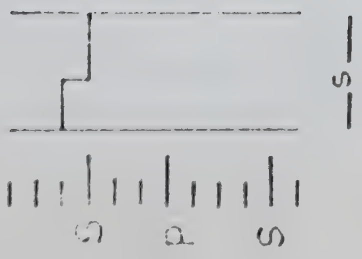

S
S
P
S

Performance: Rāga II, Performer 4

The total duration of the performance as it appears on the transcription is 135.9 seconds, of which the soloist occupies 80.8 seconds. Silence in the soloist's part, during which the accompanist continues, occupies 49.1 seconds. There are 27 phrases in total. The range of this performance is from low Ni to high Ma (one and a half octaves). This performance starts on middle Sa and ends on high Sa.

The performer, Ariyakudi Ramanuja Iyengar, uses 14 different kinds of ornaments, including gamaka, accents and stylistics, and some double ornaments. Two type-A gamakas are used.

Aa1 is used on all seven tones. The interval size is:

2nd on $\overset{\text{RS\_}}{\text{S\_}}$, $\overset{\text{GR\_}}{\text{R\_}}$, $\overset{\text{MG\_}}{\text{G\_}}$, $\overset{\text{PM\_}}{\text{M\_}}$, $\overset{\text{DP\_}}{\text{P\_}}$, $\overset{\text{ND\_}}{\text{D\_}}$, and $\overset{\text{SN}}{\text{N\_}}$;

3rd on $\overset{\text{MR\_}}{\text{R\_}}$, $\overset{\text{DM\_}}{\text{M\_}}$, $\overset{\text{NP\_}}{\text{P\_}}$, and $\overset{\text{SD}}{\text{D\_}}$;

4th on $\overset{\text{NM\_}}{\text{M\_}}$, $\overset{\text{SP\_}}{\text{P\_}}$, $\overset{\text{RD}}{\text{D\_}}$, and $\overset{\text{GN}}{\text{N\_}}$.

Aa2 is used on tone Da only. The interval size is:

2nd (x2) on $\overset{\text{NDND}}{\text{D\_\_\_}}$.

Ba1 is used on tone Pa only. Interval size is:

2nd on $\overset{\text{PM}}{\text{P\_}}$.

Five type-C gamakas are used.

Ca1 is used on six tones, Sa, Ri, Ga, Ma, Pa, and Da. The interval size is:

2nd on $\overset{\text{SR\_}}{\text{R\_}}$, $\overset{\text{RG\_}}{\text{G\_}}$, $\overset{\text{GM\_}}{\text{M\_}}$, $\overset{\text{MP\_}}{\text{P\_}}$, and $\overset{\text{PD}}{\text{D\_}}$;

DS
3rd on S_;

PS_ DR_ GD
4th on S_ , R_ , and D_.

Ca2 and Ca4 are used on tone Ri. The interval size is:

SRSR
2nd (x2) on R___.

Cd1 appears on tone Ri also. Interval size is:

DRSRSRSR
4th and 2nd (x3) on R_______.

Cf1 is used on tones Ri, Ga, Ma, and Da. The interval size is:

SRG RMG GPM
3rd and 2nd on R__, G__, and M__;

RPM
4th and 2nd on M__;

PSD
4th and 3rd on D__.

Ch1 is used on tones Ri, Ga, and Da. The interval size is:

PRR
5th and prime on R__;

RDD
5th and prime on D__;

GRR
7th and prime on R__;

GGG
Octave and prime on G__;

SDD
6th and prime on D__.

Db1 is used on tone Ga only. The interval size is:

GMG
2nd on G__.

Accent-E is used on tones Ri, Da, and Ni.

Accent-F is used on tones Sa and Pa.

Stylistic-G is used on all seven tones. The interval size is:

2nd on $\overset{RS}{S\_}$, $\overset{GR}{R\_}$, $\overset{MG}{G\_}$, $\overset{PM}{M\_}$, $\overset{DP}{P\_}$, $\overset{ND}{D\_}$, and $\overset{SN}{N\_}$;

3rd on $\overset{DM}{M\_}$, and $\overset{RN}{N\_}$.

Stylistic-H is used on tones Sa, Ri, Ga, Ma, Pa, and Da. The interval size is:

2nd on $\overset{SR}{R\_}$, $\overset{RG}{G\_}$, $\overset{GM}{M\_}$, $\overset{MP}{P\_}$;

3rd on $\overset{DS}{S\_}$;

4th on $\overset{PS}{S\_}$ and $\overset{GD}{D\_}$.

The double ornaments are used on tones Ri and Da.

Table 5.4 shows that a total of 395 tones were used by the performer, of which 66% received some kind of ornament and 34% had no ornament. Of the 395, 36% were tones with gamaka, 2% were tones with accent and 27% were tones with stylistic, and 1% were tones with double ornament.

The tones Ma and Ni are heavily ornamented (98% Ma and 91% Ni). The tones Da and Ga are the next highest (86% Da and 79% Ga). The tones Ri and Pa are ornamented approximately half of the time (59% Ri and 45% Pa). The tone Sa is least often ornamented (20%).

In Table 5.5, it can be seen that Aal, Cal, and stylistics account for a larger proportion of ornaments than any other types (32.1% Aal, 7.6% Cal, and 40.5% stylistics). Stylistics are used more frequently than Cal and Aal in this performance. Some tones receive more of a given gamaka than do others. Of the total 84 type Aal, the tone Ma receives the highest (23), Sa receives none, and the rest of the tones

Table 5.4
Percentage Distribution of Tones and Gamakas:
Rāga II, Performer 4

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(5)	7	(3)	4	(6)	9			(14)	20	(57)	80	100%	(71)
Ri	(30)	41	(2)	3	(10)	14	(1)	1	(43)	59	(30)	41	100%	(73)
Ga	(29)	52			(15)	27			(44)	79	(12)	21	100%	(56)
Ma	(30)	63			(17)	35			(47)	98	(1)	2	100%	(48)
Pa	(7)	15	(1)	2	(9)	24			(17)	45	(21)	55	100%	(38)
Da	(26)	46	(3)	5	(19)	32	(2)	4	(50)	86	(7)	14	100%	(57)
Ni	(16)	31	(1)	2	(30)	58			(47)	91	(5)	9	100%	(52)
Total	(143)	36	(10)	2	(105)	27	(3)	1	(262)	66	(133)	34	100%	(395)

Table 5.5

Joint Distribution of Tones and Gamakas: Rāga II, Performer 4

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Aa1	╲		11	17	23	1	16	16	84	32.1
a2	╲╱╲						1		1	.4
Ba1	╲					3			3	1.1
Ca1	╱	5	4	3	2	3	3		20	7.6
a2	╱╲╱		8						8	3.1
a4	╱╲╱╲╱╲╱		2						2	.8
d1	╱╲╱╲‾		1						1	.4
f1	╱╲		1	4	5		3		13	5.0
h1	╭		3	1			3		7	2.7
Db1	∧			4					4	1.5
Gamaka Total		5	30	29	30	7	26	16	143	54.6
E	•		2				3	1	6	2.3
F	—	3				1			4	1.5
Accent Total		3	2			1	3	1	10	3.8
G	⋎	3	8	13	16	5	18	30	93	35.5
H	⋏	3	2	2	1	4	1		13	5.0

Table 5.5 (Continued)

Joint Distribution of Tones and Gamakas:
Rāga II, Performer 4

Gamaka Type	Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Stylistic Total	6	10	15	17	9	19	30	106	40.5
Double Ornaments		1				2		3	1.1
Grand Total	14	43	44	47	17	50	47	262	100.0

are spread over between these extremes (Ri 11, Ga 17, Da and Ni 16, Pa 1 respectively). Of the total 20 type Cal, the tone Ri receives the most (19). Of the stylistics, the tone Ni receives the most (30), tones Da, Ma, and Ga are the next highest (18, 16, and 13 respectively).

More varieties of type-C gamakas are used in this performance than type-A, of which tone Ma receives the most (23) for type-A and tone Ri receives the most (19) for type-C gamaka. Stylistic-G is used on all seven tones and more on tone Ni (30). Stylistic-H is used on all tones except Ni but stylistic-G is used more than stylistic-H (93, 13 respectively). Double ornaments are found on tones Ri and Da.

This performer does not hold any tone more than a second which, in contrast to other performances in this corpus, is unique to his style.

Rāga II, Performer 2

Principal Melody: Male Singer

Performer: Semmengudi Srinivasa Iyer

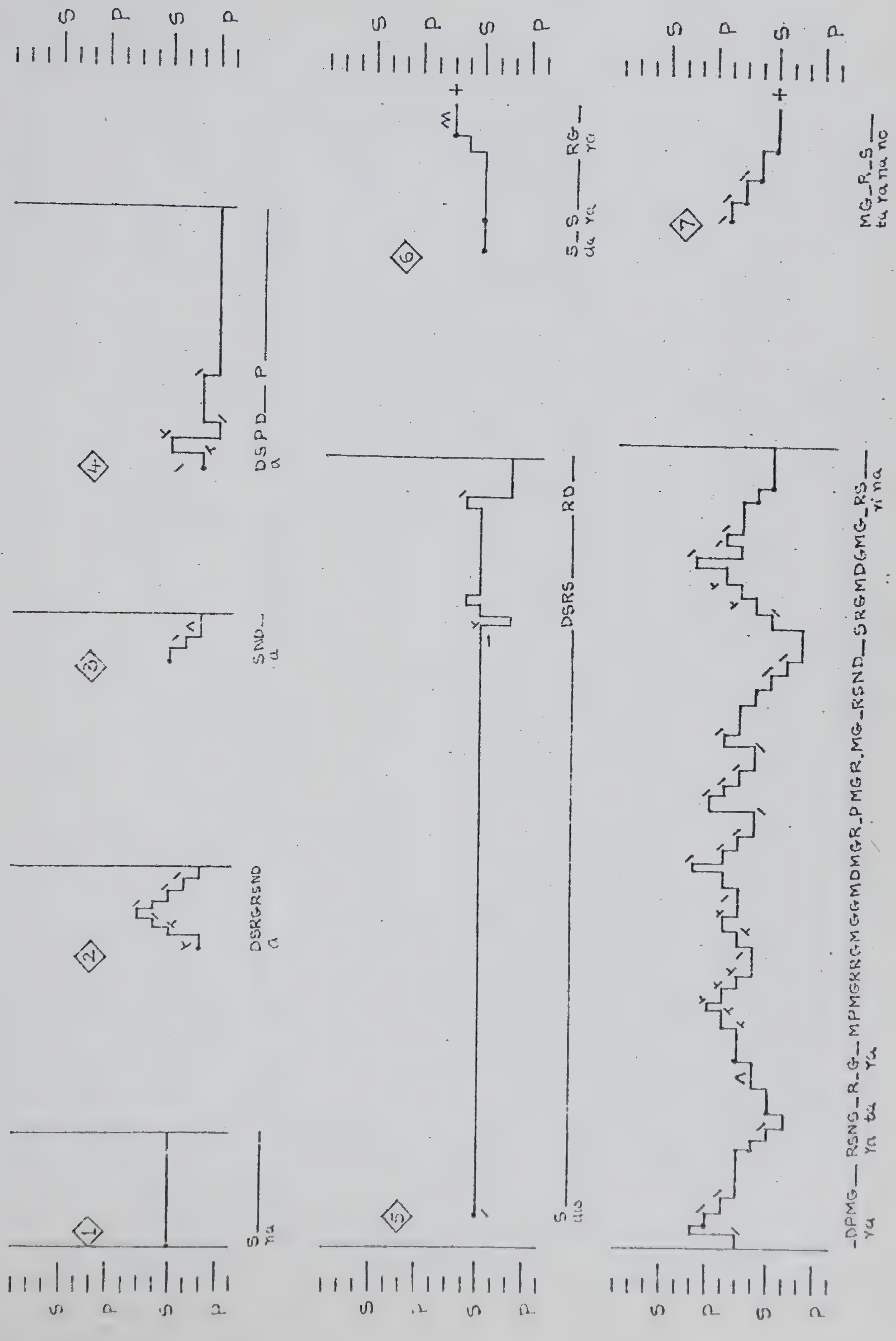
Melodic Accompaniment: Violin

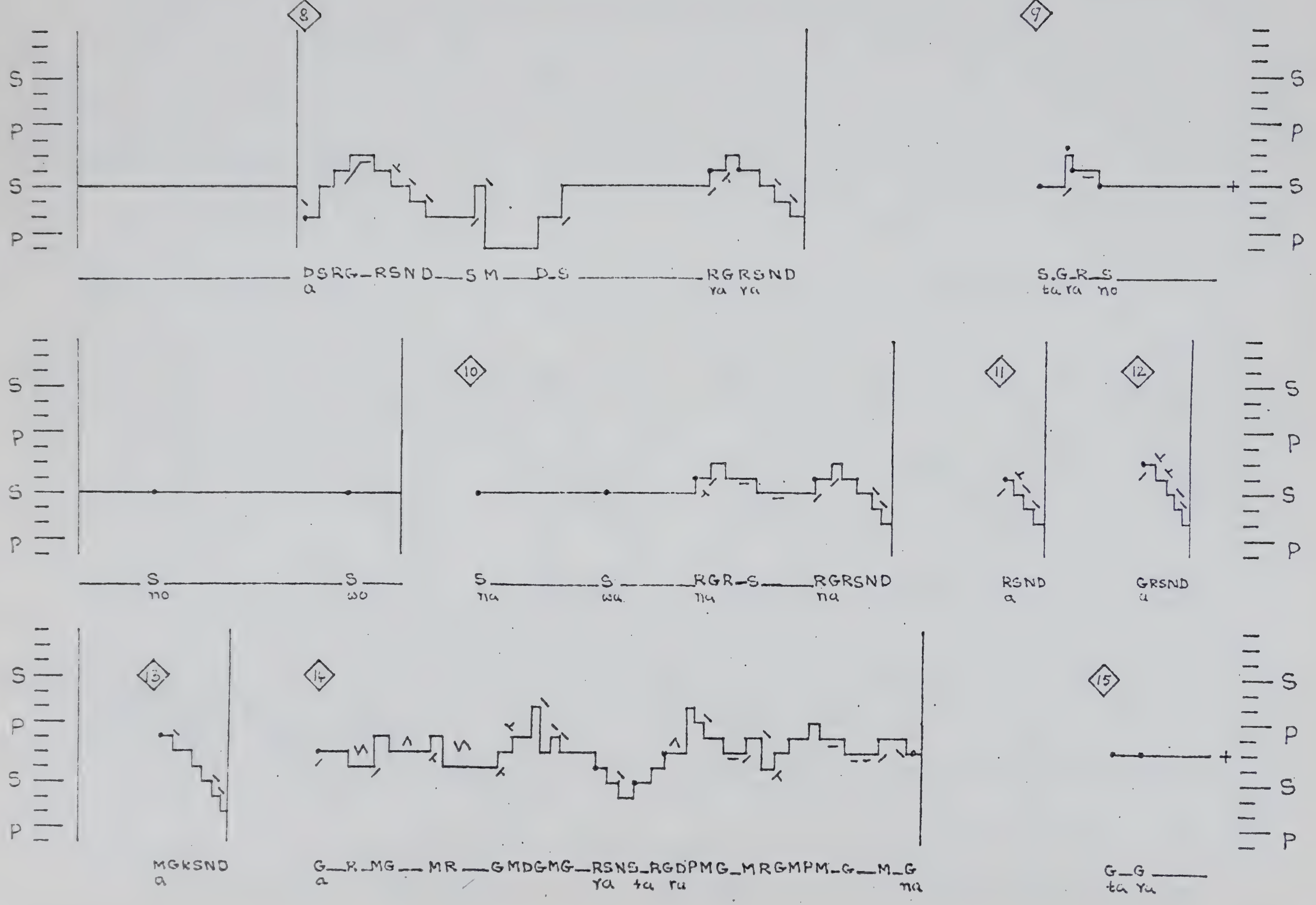
Drone Accompaniment: Tambūra

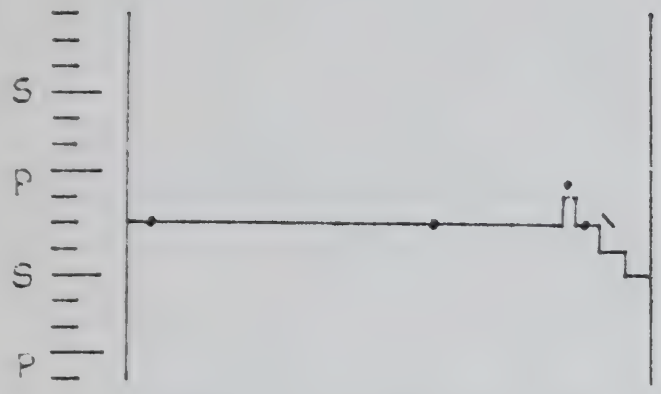
Performance Duration: 3 minutes, 16.5 seconds

Tape Source: Private recording made in India obtained from Ranganayaki Ayyangar

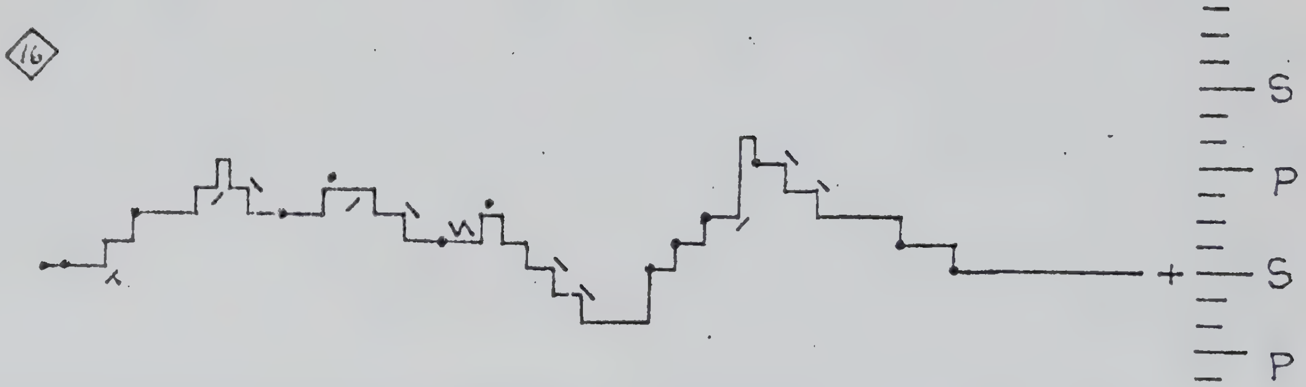
Extract From:
- Kriti: (Title Not Given)
- Rāga: Pūrvikalyāni
- Tāla: (Not Given)
- Language: (Not Given)
- Composer: (Not Given)

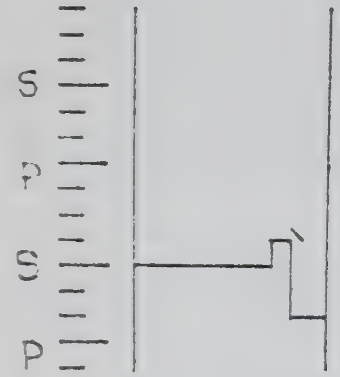

S
P
S
P
1
2
3
4
5
6
7
S ya
DSRGRSND a
SND__ a
DSPD__ P__ a
S da
DSRS______RD__
S_S______RG__ da ya ya
-DPMG__ RSNG_R_G__MPMGKRGMGGMDMGR_PMGR_MG_RSND__SRGMDGMG_RS__
ya ya tu ya yi na
MG_R_S__ tu ya na no


8
9
S
P
S
P
DSRG—RSND—S M—D.S——RGRSND
a
ra ra
S.G.R.S——
ta ra no
+
10
11
12
S——S——
no
wo
S——S——RGR-S——RGRSND
na
wa
na
na
RSND
a
GRSND
a
13
14
15
MGKSND
a
G—R.MG—MR—GMDGMG—RSNS—RGDPMG—MRGMPM—G—M—G
a
ra
ta
ru
na
G—G——
ta
ra

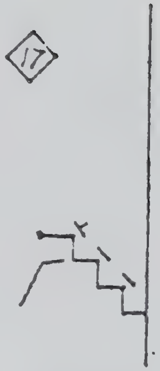

S
P
S
P
_G
na
G
na
MGRS
na

16

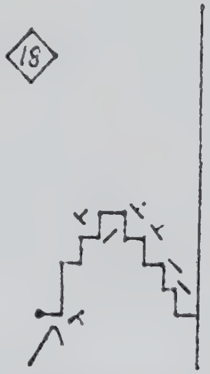

S
P
S
P
+
SS_RG__MPMGG_MMGR_R_GRSND__SRGDPMG__R_S
nana na na na taranana na ra na



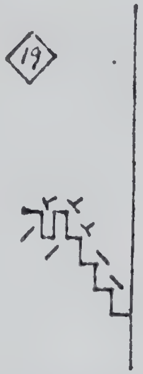
17



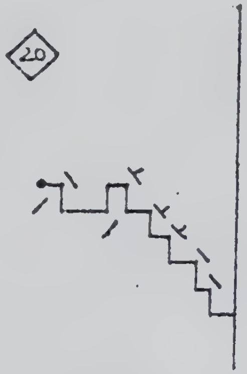
18


DSRGGRSND
aw

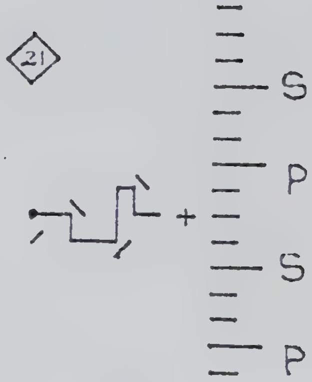
19

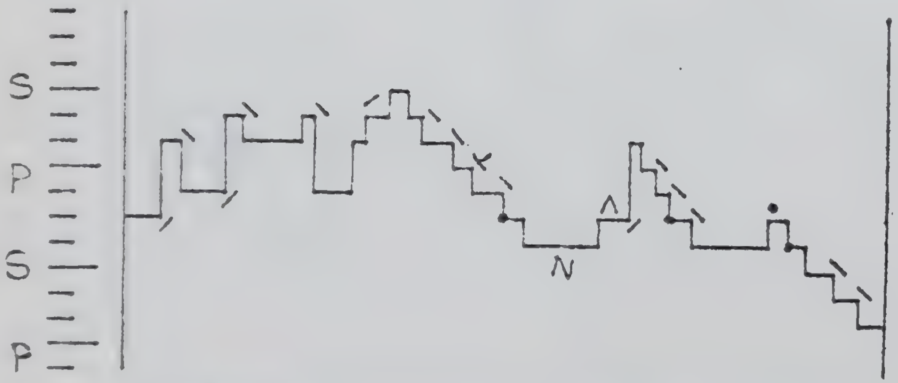


20

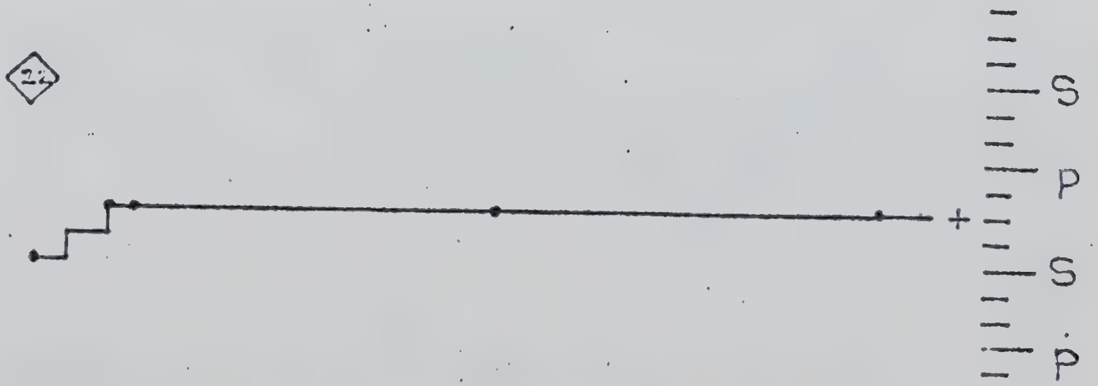

MG_MGRSND
aw

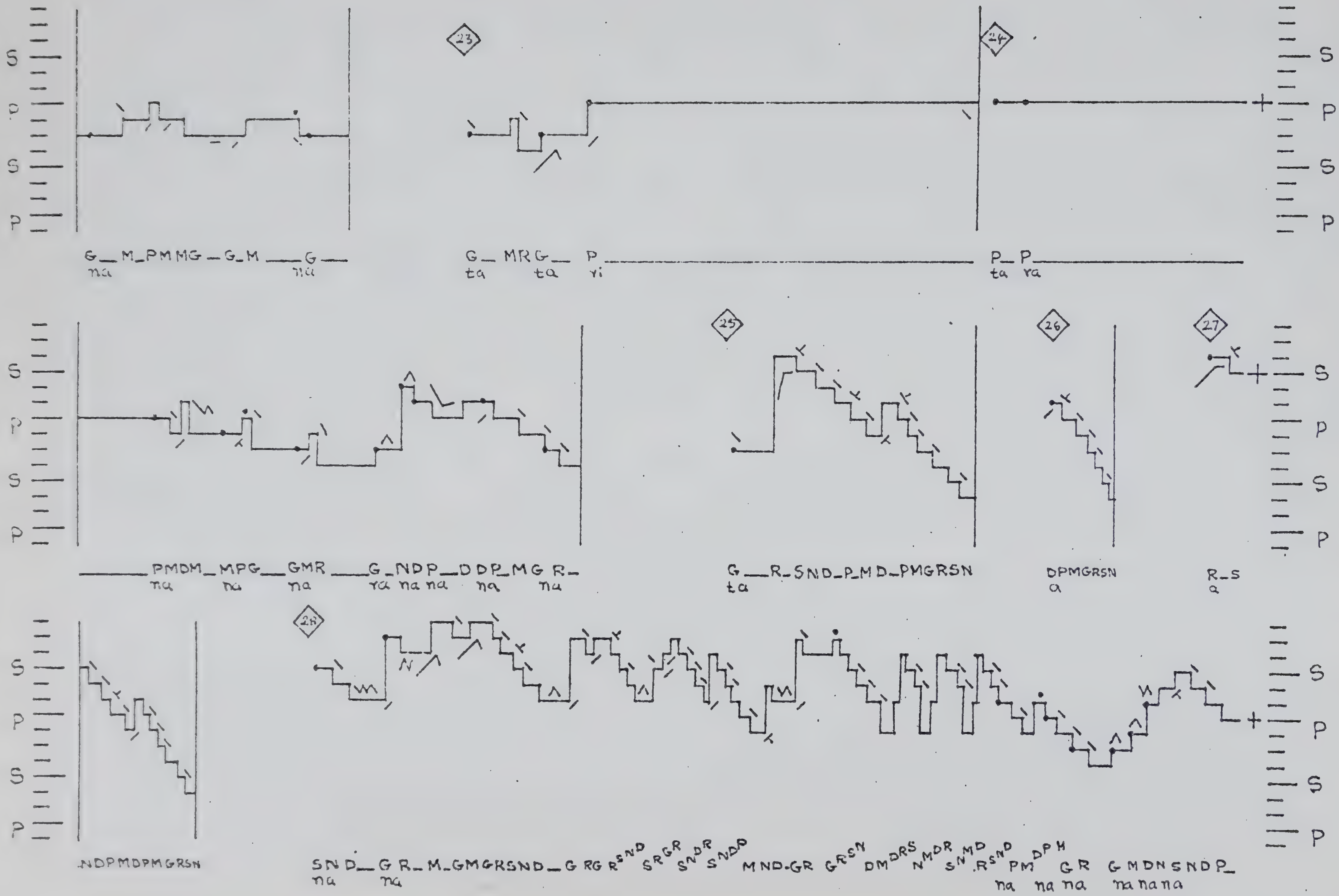
21

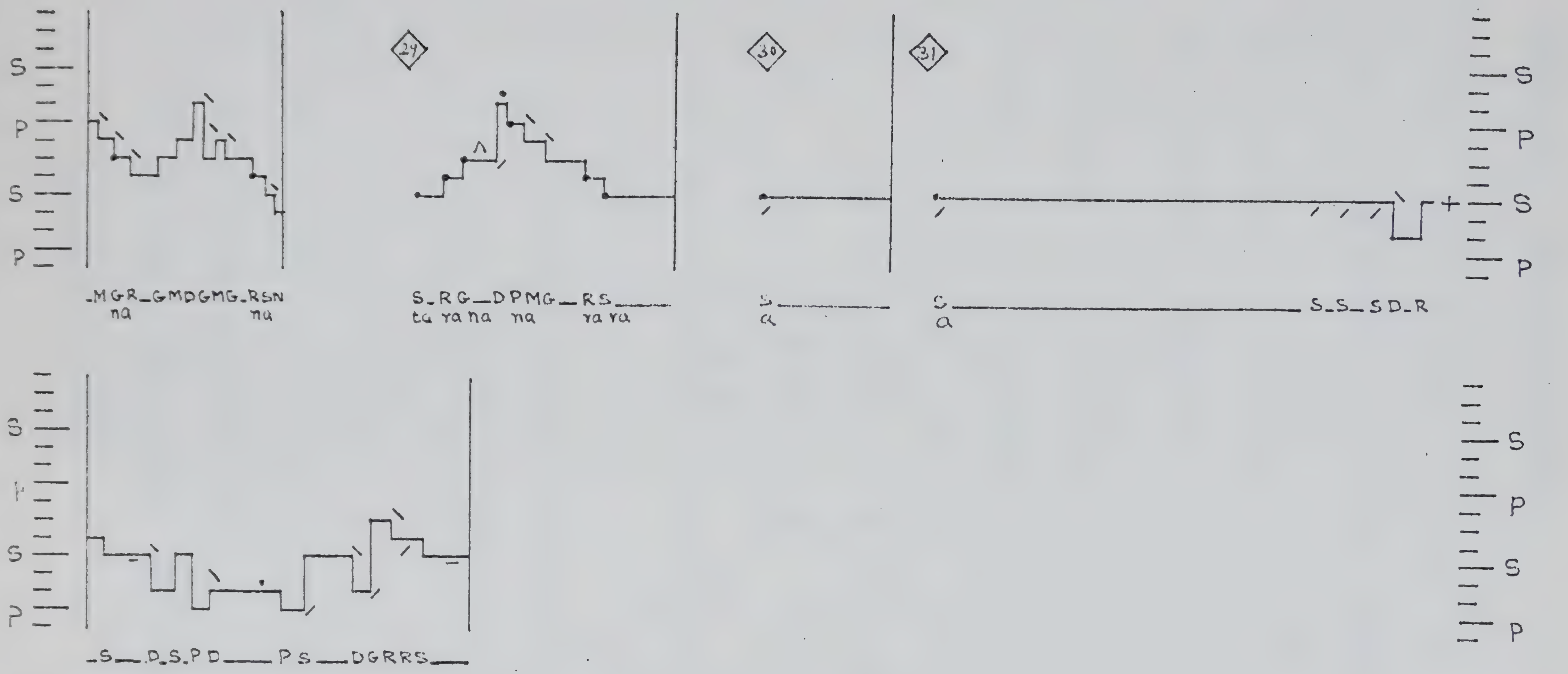

S
P
S
P
+
G_R_MG
aw


S
P
S
P
N
_DM.ND NM_DNSNDPMGR__GDPMGR__GRSND-
na na na

22


S
P
S
P
+
S_RG G
tu n na
G
na
G
na


S
P
S
P
23
24
25
26
27
28
G_ M_PMMG_G_M ___G___
na na
G_ MRG__ P
ta ta ri
P_ P
ta ra
PMDM_ MPG__GMR ___G_NDP_DDP_MG R_
na na na ra na na na na
G__R_SND_P_MD_PMGRSN
ta
DPMGRSN
a
R_S
a
NDPMDPMGRSN
SND_ G R_ M_GMGRSND_ G RG RSND SRGR SNDR SNDP MND-GR GRSN DMDRS NMDR SNMD .RSND PMDPM GR GMDNSNDP_
na na na na na nanana


S
P
S
P
-MGR_GMDGMG_RSN
na
na
29
S_RG_DPMG_RS
ta ra na na
ra ra
30
S
a
31
S
a
S_S_SD_R
S
P
S
P
S
P
S
P
-S_D_S.PD_PS_DGRRS
S
P
S
P

Performance: Rāga II, Performer 2

The total duration of the performance as it appears on the transcription is 199.3 seconds, of which the soloist occupies 149.5 seconds. Silence in the soloist's part, during which the accompaniment continues, occupies 49.8 seconds. There are 31 phrases in total. The range of this performance is low Ma to high Ma (two octaves). This performance starts and ends on middle Sa.

The performer, Semmangudi Srinivasa Iyer, uses 18 different kinds of ornaments, including gamakas, accents, stylistics, and some double ornaments. Five type-A gamakas are used.

Aa1 is used on all seven tones. The interval size is:

2nd on $\overset{\text{RS}}{\text{S\_}}$, $\overset{\text{GR}}{\text{R\_}}$, $\overset{\text{MG}}{\text{G\_}}$, $\overset{\text{PM}}{\text{M\_}}$, $\overset{\text{DP}}{\text{P\_}}$, $\overset{\text{ND}}{\text{D\_}}$, and $\overset{\text{SN}}{\text{N\_}}$;

3rd on $\overset{\text{MR}}{\text{R\_}}$, $\overset{\text{PG}}{\text{G\_}}$, $\overset{\text{DM}}{\text{M\_}}$, and $\overset{\text{SD}}{\text{D\_}}$;

4th on $\overset{\text{PR}}{\text{R\_}}$, $\overset{\text{DG}}{\text{G\_}}$, $\overset{\text{NM}}{\text{M\_}}$, $\overset{\text{SP}}{\text{P\_}}$, and $\overset{\text{RD}}{\text{D\_}}$;

5th on $\overset{\text{SM}}{\text{M\_}}$.

Aa2 is used on tone Ri and Da. The interval size is:

2nd (x2) on $\overset{\text{GRGR}}{\text{R\_\_\_}}$ and $\overset{\text{NDND}}{\text{D\_\_\_}}$;

3rd (x2) on $\overset{\text{MRMR}}{\text{R\_\_\_}}$.

Aa3 is used on tone Da only. The interval size is:

2nd and 3rd (x3) on $\overset{\text{NDNDND}}{\text{D\_\_\_\_\_}}$.

Ac2 is used on tone Ma only. The interval size is:

3rd and 2nd on $\overset{\text{DMPM}}{\text{M\_\_\_}}$.

Af1 is used on tone Pa only. The interval size is:

2nd and prime on $\overset{\text{DPP}}{\text{DP\_}}$.

Ba1 is used on tone Ma only. The interval size is:

2nd on $\overset{\text{MG}}{\text{M\_}}$.

Ca1 is used on all seven tones. The interval size is:

2nd on $\overset{\text{NS}}{\text{S\_}}$, $\overset{\text{SR}}{\text{R\_}}$, $\overset{\text{RG}}{\text{G\_}}$, $\overset{\text{GM}}{\text{M\_}}$, $\overset{\text{MP}}{\text{P\_}}$, and $\overset{\text{PD}}{\text{P\_}}$;

3rd on $\overset{\text{DS}}{\text{S\_}}$, $\overset{\text{SG}}{\text{G\_}}$, $\overset{\text{RM}}{\text{M\_}}$, $\overset{\text{GP}}{\text{P\_}}$, $\overset{\text{MD}}{\text{D\_}}$, and $\overset{\text{PN}}{\text{N\_}}$;

4th on $\overset{\text{DR}}{\text{R\_}}$, $\overset{\text{SM}}{\text{M\_}}$, $\overset{\text{RP}}{\text{P\_}}$, $\overset{\text{GD}}{\text{D\_}}$, and $\overset{\text{MN}}{\text{N\_}}$;

5th on $\overset{\text{DG}}{\text{G\_}}$;

6th on $\overset{\text{SD}}{\text{D\_}}$.

Four type-C gamakas are used.

Ca2 is used on tone Ri. The interval size is:

2nd (x2) on $\overset{\text{SRSR}}{\text{R\_\_\_}}$.

Cf1 is used on tone Ga, Ma, and Da. The interval size is:

3rd and 2nd on $\overset{\text{RMG}}{\text{G\_\_}}$ and $\overset{\text{GPM}}{\text{M\_\_}}$;

4th and 2nd on $\overset{\text{RPM}}{\text{M\_\_}}$;

4th and 3rd on $\overset{\text{PSD}}{\text{D\_\_}}$.

Ch1 is used on tones Ri and Ga. The interval size is:

2nd and prime on $\overset{\text{GRR}}{\text{G\_\_}}$;

4th and prime on $\overset{\text{DRR}}{\text{R\_\_}}$;

7th and prime on $\overset{\text{GRR}}{\text{R\_\_}}$;

9th and prime on $\overset{\text{SRR}}{\text{R\_\_}}$.

Three type-D gamakas are used.

Dal is used only on tone Ni. The interval size is:

2nd on $\overset{\text{NS}}{\text{N\_}}$.

Dbl is used on tones Ri, Ga, Ma, Da, and Ni. The interval size is:

2nd or $\overset{\text{RGR}}{\text{R\_\_}}$, $\overset{\text{GMG}}{\text{G\_\_}}$, $\overset{\text{MPM}}{\text{M\_\_}}$, $\overset{\text{DND}}{\text{D\_\_}}$, and $\overset{\text{NSN}}{\text{N\_\_}}$;

3rd on $\overset{\text{DSD}}{\text{D\_\_}}$.

Db2 is used on tone Ga only. The interval size is:

2nd (x2) on $\overset{\text{GMGMG}}{\text{G\_\_\_\_}}$.

Accent-E is used on tone Ga, Ma, and Da.

Accent-F is used on tone Sa, Ri, Ga, and Ma.

Stylistic-G is used on all seven tones. The interval size is:

2nd on $\overset{\text{RS}}{\text{S\_}}$, $\overset{\text{GR}}{\text{R\_}}$, $\overset{\text{MG}}{\text{G\_}}$, $\overset{\text{PM}}{\text{M\_}}$, $\overset{\text{DP}}{\text{P\_}}$, and $\overset{\text{SN}}{\text{N\_}}$;

3rd on $\overset{\text{SD}}{\text{D\_}}$;

4th on $\overset{\text{SP}}{\text{P\_}}$.

Stylistic-H is used on seven tones. The interval size is:

2nd on $\overset{\text{NS}}{\text{S\_}}$, $\overset{\text{SR}}{\text{R\_}}$, $\overset{\text{RG}}{\text{G\_}}$, $\overset{\text{GM}}{\text{M\_}}$, and $\overset{\text{MP}}{\text{P\_}}$;

3rd on $\overset{\text{DS}}{\text{S\_}}$ and $\overset{\text{MD}}{\text{D\_}}$;

MN
4th on N_.

Stylistic-I ornament is used on tone Ri. Interval size is:

RS
2nd on R_.

(This is the only example in the corpus in which stylistic-I is used on any tone.)

Double ornaments are used on tones Ri and Da.

Table 5.6 shows that a total of 444 tones were used by the performer, of which 68% received some kind of ornament and 32% had no ornament. Of the 444, 53% were tones with gamaka, 3% were tones with accent, 10% were tones with stylistic, and 2% were tones with double ornament.

The tones Ni, Ma, and Da are heavily ornamented (93% Ni, 86% Ma and 84% Da). The tones Pa and Sa are ornamented less than half of the time (42% Pa and 35% Sa). The tones Ga and Ri, are between these two extremes (75% Ga and 65% Ri).

In Table 5.7, it can be seen that types Aal, Cal, and stylistics account for a larger proportion of ornaments than any other types (49.3% Aal, 17.9% Cal, and 15.2% stylistics). Some tones receive more of a given gamaka than do others. Of the total 149 type Aal, tones Da and Ma receive 34 and 31 respectively. Of the total 54 type Cal, the tones Ga, and Ri, and Ma receive 17 and 12 respectively. Of the stylistics, tones Sa and Ri receive more than any other tones (13 and 11 respectively). More varieties of type-A, type-C, and type-D are used than type-B. Type-A gamaka is mostly on tones Da and Ri; more type-C on tone Ga. Type-D is spread thinly over tones Ri, Ga, Ma, Da, and Ni, but is used mostly on tone Ga (6); and type-B is used only on tone Ma. Within the

Table 5.6

Percentage Distribution of Tones and Gamakas:
Rāga II, Performer 2

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(10)	13	(3)	4	(13)	17	(1)	1	(27)	35	(49)	65	100%	(76)
Ri	(38)	48	(2)	3	(11)	14			(51)	65	(28)	35	100%	(79)
Ga	(54)	60	(4)	4	(5)	6	(2)	2	(65)	72	(25)	28	100%	(90)
Ma	(45)	70	(3)	5	(6)	9	(1)	2	(55)	86	(9)	14	100%	(64)
Pa	(6)	19			(6)	19	(1)	3	(13)	42	(18)	58	100%	(31)
Da	(48)	75	(1)	1	(3)	5	(2)	3	(54)	84	(10)	16	100%	(64)
Ni	(35)	88			(2)	5			(37)	93	(3)	17	100%	(40)
Total	(236)	53	(13)	3	(46)	10	(7)	2	(302)	68	(142)	32	100%	(444)

Table 5.7

Joint Distribution of Tones and Gamakas: Rāga II, Performer 2

Gamaka Type		Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
Aa1	╲	2	22	30	30	2	31	32	149	49.3
a2	╲╱╲		3				2		5	1.6
a3	╲╱╲╱╲						1		1	.3
c2	╲∩				1				1	.3
f1	╲_					1			1	.3
Ba1	╲				1				1	.3
Ca1	╱	8	7	15	10	3	10	1	54	17.9
a2	╱╲╱		2						2	.7
f1	∧			1	2		1		4	1.3
h1	╱¯		3	1					4	1.3
Da1	╱							1	1	.3
b1	∧		1	6	1		3	1	12	4.0
b2	∧∧			1					1	.3
Gamaka Total		10	38	54	45	6	48	35		78.1
E	•			3	2		1		6	2.0
F	–	3	2	1	1				7	2.3
Accent Total		3	2	4	3		1		13	4.3

Table 5.7 (Continued)

Joint Distribution of Tones and Gamakas:
Rāga II, Performer 2

Gamaka Type	Sa	Ri	Ga	Ma	Pa	Da	Ni	Sum of Type	%
G ⋎	10	8	3	3	5	2	1	32	10.6
H ⋏	3	2	2	3	1	1	1	13	4.3
I ⋎		1						1	.3
Stylistic Total	13	11	5	6	6	3	2	46	15.2
Double Ornaments	1		2	1	2	1		7	2.3
Grand Total	27	51	65	55	13	54	37	302	99.9*

corpus, this is the only performance of Rāga II in which the performer uses Aa3, Ac2, and Db2. Accent-E is used more on tone Ga, and accent-F is on tone Sa. Both stylistic-G and stylistic-H are used on all seven tones but stylistic-G is used more than H (32 and 13 respectively). The tones Sa and Ri get more of stylistic-G than any other tones. Stylistic-I is used in this performance only of the entire corpus. Double ornaments are found in all tones except Ri and Ni.

Table 5.8 shows that of the total 444 tones, 4% are held tones. The held tones are Sa, Ga, and Pa. The tone Pa is found in both low and middle range. Among the held tones, Sa has the highest percentage (14%); next is tone Pa (10%), and tone Ga (6%).

Summary

The performers 1, 4, and 2 in Rāga II, Pūrvikalyāni, ornament 70%, 66%, and 68% of all tones respectively; the other tones are unornamented. Of the ornamented tones, Ma and Ni are ornamented most frequently. The tones Da, Ga, and Ri are the next highest. The tones Pa and Sa are ornamented least often.

All three performers use Aal, Cal, and stylistics more than any other gamaka type, and stylistics are used more than Cal gamaka. Aal is used mostly on tone Da by performers 1 and 2; performer 4 uses this on tone Ma. Cal occurs mostly on tones Ri and Ga; performers 1 and 4 give this gamaka on tone Ri and performer 2 on tone Da. Performer 1 uses more stylistics on tone Ri; performer 4 on tone Ni and performer 2 on tone Sa. Unlike Rāga I, Shankarābharana, performers 1, 4, and 2 use different combinations of types; but each performer uses unique kinds

Table 5.8

Distribution of Held Tones:
Rāga II, Performer 2

		Range							
		Low		Middle		High			
Tone	Frequency of Tones	Unornamented	Ornamented	Unornamented	Ornamented	Unornamented	Ornamented	Total	%
Sa	76			7	4			11	14
Ri	79								
Ga	90			5				5	6
Ma	64								
Pa	31		1	1	1			3	10
Da	64								
Ni	40								
Total	444		1	13	5			19	4

of gamaka. For instance, Acl, Ccl and Cel are used on tone Ri by performer 1 only, Ca4 and Cdl are used on tone Ri by performer 4 only, and Aa3, Ac2, Db2 and stylistic-I are used by performer 2 only.

It is apparent that tones Ri, Ga, Ma, and Da are most important to Rāga Pūrvikalyāni because all the three performers agree in giving gamaka to these tones. Each performer uses a few unique types of gamaka which reveals their individual style in presenting ālāpana. Performers 1 and 2 agree on held tones Sa, Ga, and Pa, but performer 4 does not use any held tone in this performance. All three performers start the performance on middle Sa; performers 1 and 2 end on middle Sa, and performer 4 ends on high Sa.

CHAPTER VI

GAMAKAS IN RĀGA III: MADHYAMĀVATI

Rāga Madhyamāvati

The rāga Madhyamāvati is a janya rāga, derived from Kharaharapriya which is rāga 22 in the 72-melakarta system. It is considered auspicious. Because it is believed that any error that may have been made by a performer during a program will be erased or forgiven if sung at the end, the final item (whether a full-length repertory number or a brief utterance analogous to a postscript) in a traditional concert is in Madhyamāvati. A major item elsewhere in a concert may also be in this rāga.

Madhyamāvati is an audava (5-tone) rāga in both ascent and descent, the tones taken from Kharaharapriya. The tonal inventory is Shadja (Sa), Chatuśruti Rishabha (Ri_2), Sudha Madhyama (Ma_1), Panchama (Pa), and Kaishiki Nishādha (Ni_1).

Figure 6.1

Rāga III: Madhyamāvati in
Solfège and Staff Notation

Sa $\underset{\wedge}{Ri_2}$ Ma_1 Pa $\underset{\wedge}{Ni_1}$ Sa

Sa $\overset{\grave{}}{Ni_1}$ Pa Ma_1 $\overset{\sim}{Ri_2}$ Sa

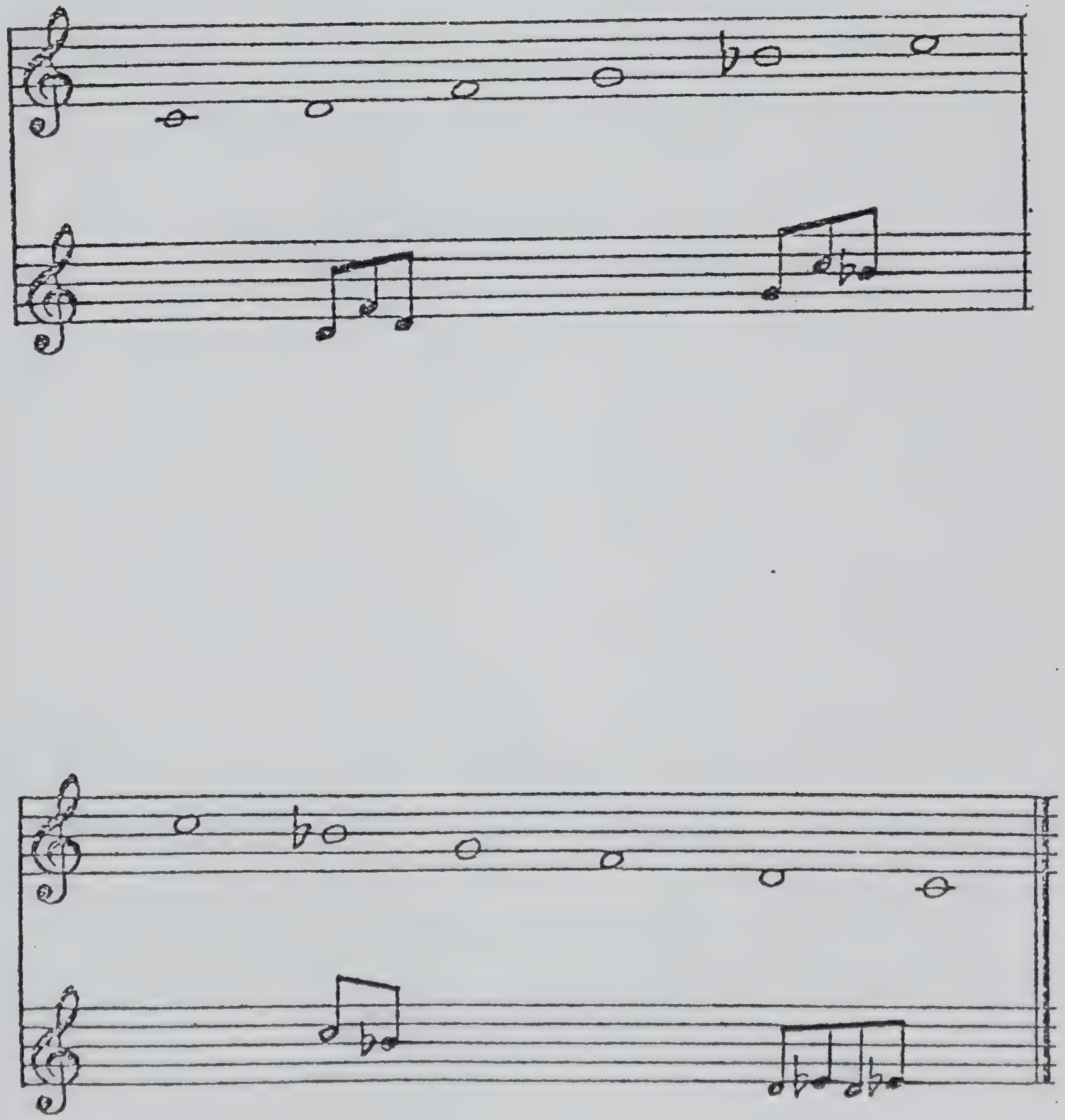
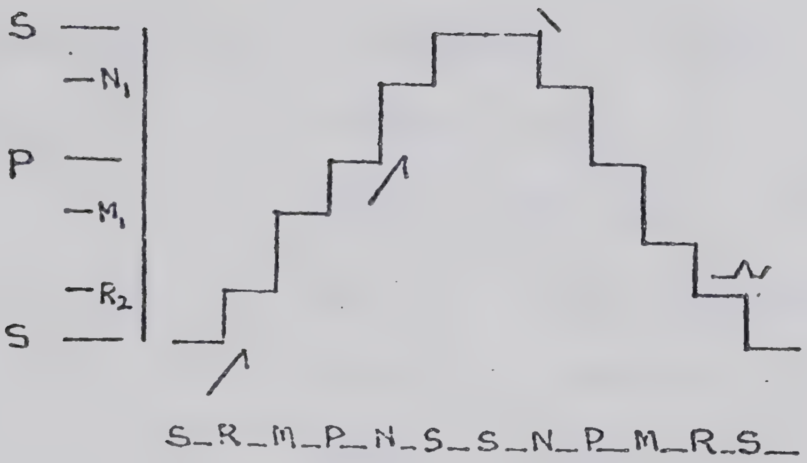
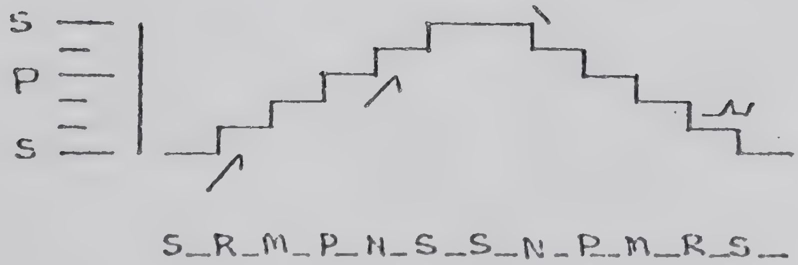


Figure 6.2

Rāga III: Madhyamāvati in Graph


S
N_1
P
M_1
R_2
S
S_R_M_P_N_S_S_N_P_M_R_S_

By Interval Size


S
P
S
S_R_M_P_N_S_S_N_P_M_R_S_

By Scale Step

Rāga III, Performer 1

Principal Melody: Female Singer

Performer: M. S. Subbulakshmi

Melodic Accompaniment: Violin

Drone Accompaniment: Tambūra

Performance Duration: 1 minute, 51.6 seconds

Disc Source: CONCERT ALBUM

Odeon S/MOAE 5013

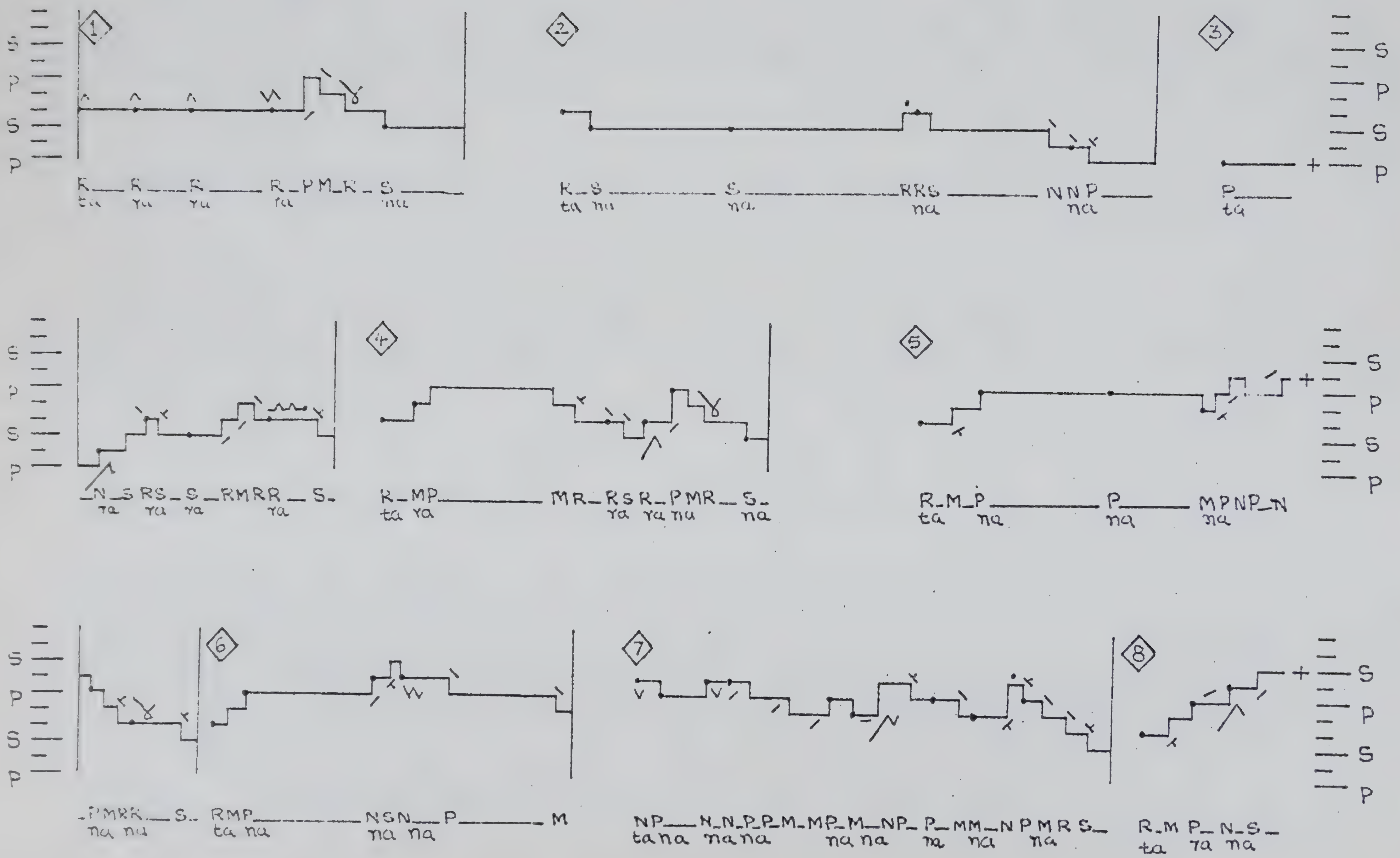
Extract From: Kriti: "Palintsu Kamakshi"

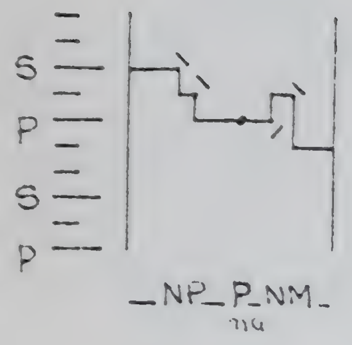
Rāga: Madhyamāvati

Tāla: Ādi

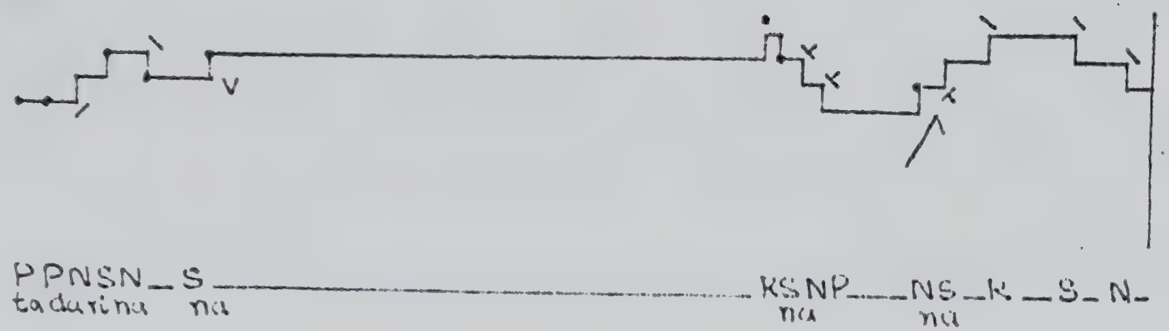
Language: Telugu

Composer: Syama Sastri

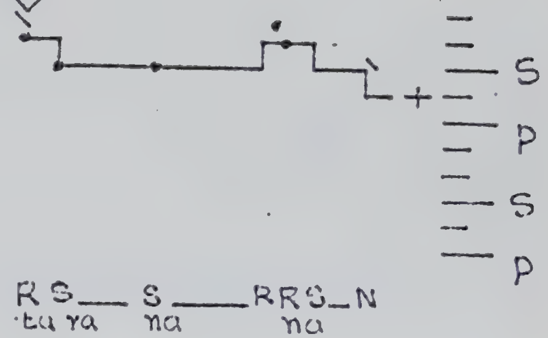

S
P
S
P
1
K_R_R_R_R_PM_K_S_
ta ra ra ra na
2
K_S_S_RRS_NNP_
ta na na na na
3
P_
ta
4
_N_S RS_S_RMRR_S-
ra ra ra ra
R_MP_MR_RSR_PMR_S-
ta ra ra ra na na
5
R_M_P_P_MPNP_N
ta na na na
6
_PMRR_S_RMP_NSN_P_M
na na ta na na na
7
NP_N_N_P_P_M_MP_M_NP_P_MM_NPMRS_
tana nana nana na na na
8
R_M P_N_S_
ta ra na

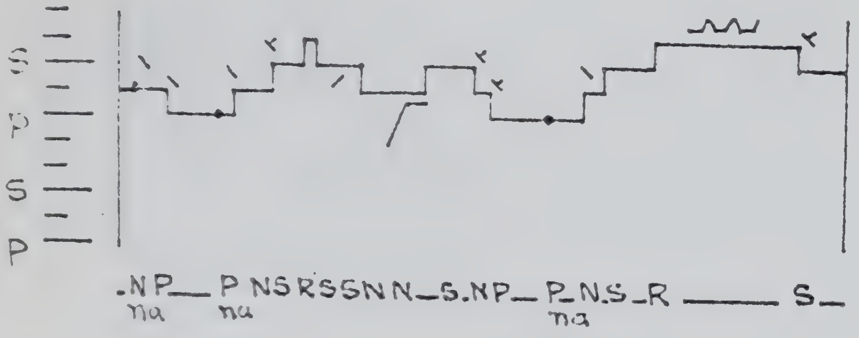

S
P
S
P
_NP_P_NM_
na

9

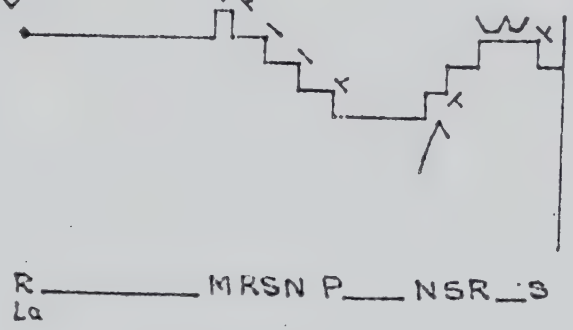

PPNSN_S .... KSNP___NS_K _S_N_
tadarina na KSNP na NS na
V

10

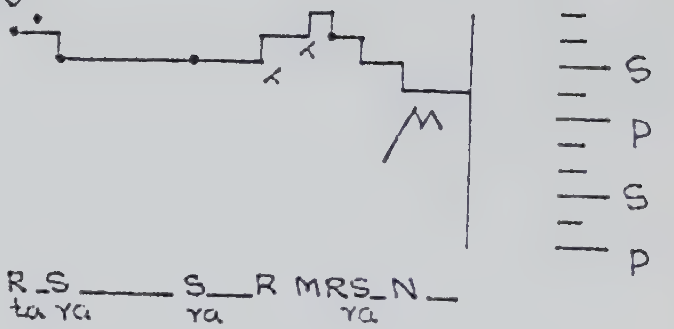

RS___ S ___RRS_N
tu ra na na
S
P
S
P


S
P
S
P
.NP__ P NSRSSNN_S.NP_ P_N.S_R _____ S_
na na na

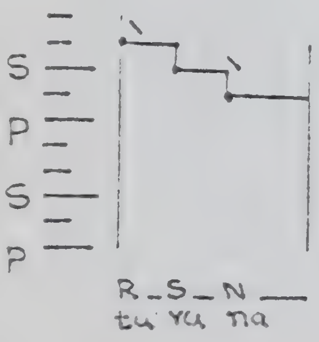
11


R__________ MRSN P___NSR_S
La

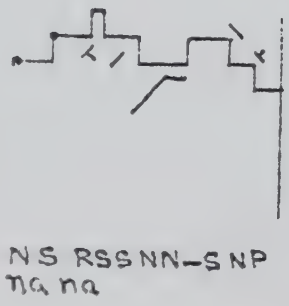
12


R_S _____ S__R MRS_N _
ta ra ra ra
S
P
S
P

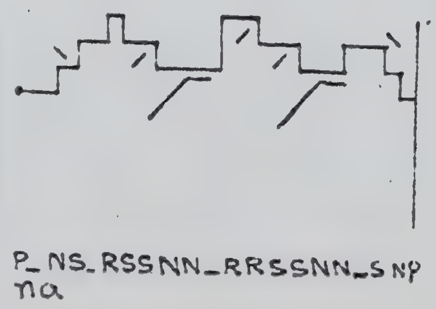
13


S
P
S
P
R_S_N ___
tu ra na

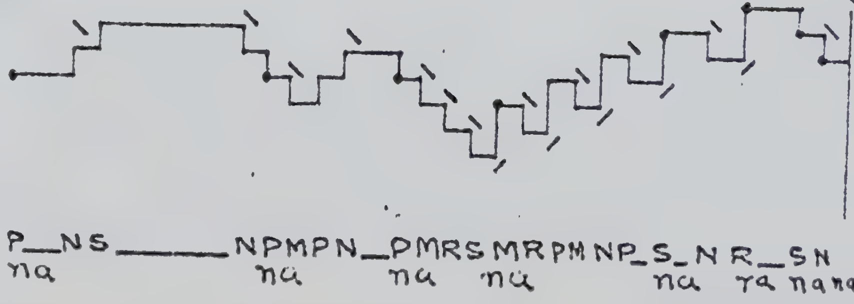
14


NS RSSNN_SNP
na na

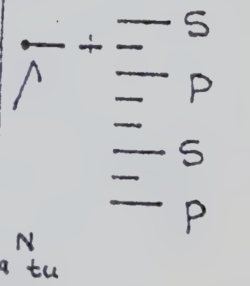
15

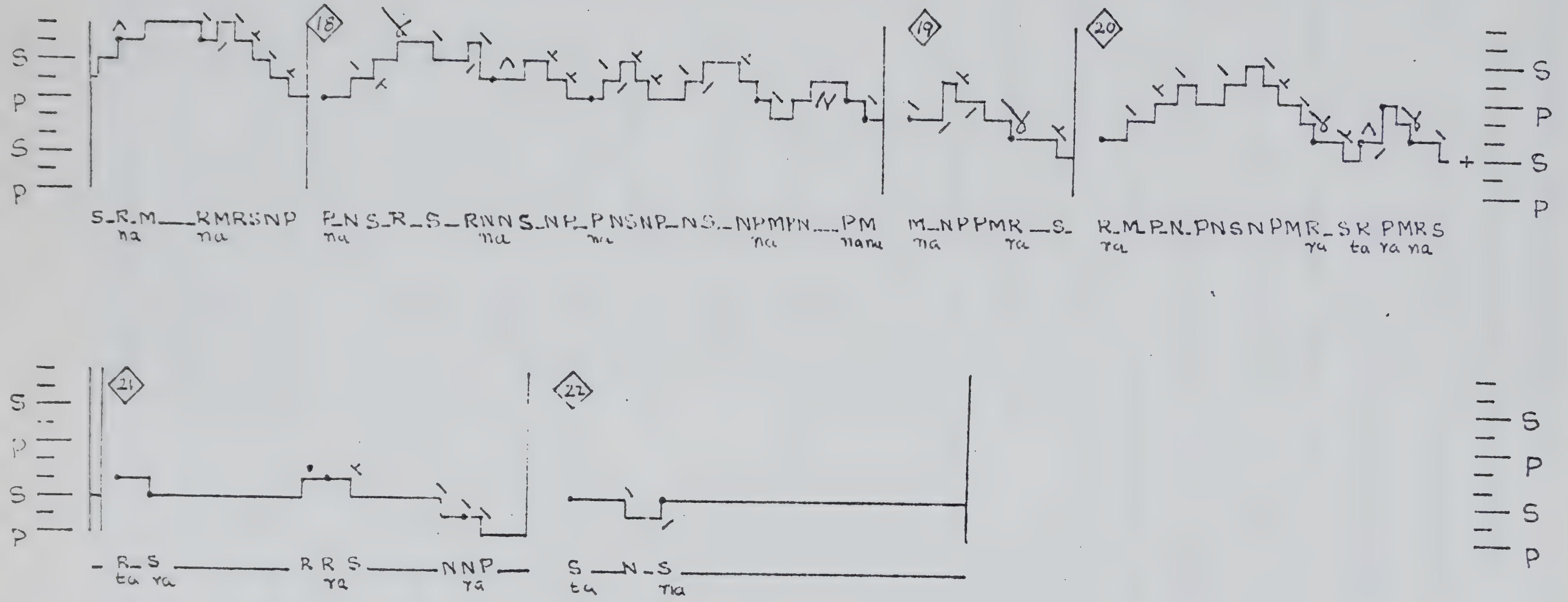

P_NS_RSSNN_RRSSNN_SNP
na

16


P__NS ______ NPMPN_PMRSMRPMNP_S_N R__SN
na na na na na ra nana

17




18
19
20
21
22
S
P
S
P
S-R-M——RMRSNP
na na
P-N S-R-S-RNNS-NP-PNSNP-NS.-NPMPN—PM
na na na na nana
M-NPPMR—S-
na ra
R-M-P-N-PNSNPMR-SK PMRS
ra ra ta ra na
+
- R-S ——— RRS ——NNP—
ta ra ra ra
S—N-S ————
ta na

Performance: Rāga III, Performer 1

The total duration of the performance as it appears on the transcription is 114.8 seconds, of which the soloist occupies 102.7 seconds. Silence in the soloist's part, during which the accompaniment continues, occupies 12.1 seconds. There are 22 phrases in total. The range of this performance is from low Pa to high Ma (two octaves). This performance starts on middle Ri and ends on middle Sa.

The performer, M. S. Subbulakshmi, uses 20 types of ornaments, including gamakas, accents, stylistics, and some double ornaments. Four type-A gamakas are used.

Aa1 is used on all five tones Sa, Ri, Ma, Pa, and Ni. The interval size is:

2nd on $\overset{\text{RS}}{\text{S}\_}$, $\overset{\text{PM}}{\text{M}\_}$, and $\overset{\text{SN}}{\text{N}\_}$;

3rd on $\overset{\text{MR}}{\text{R}\_}$ and $\overset{\text{RN}}{\text{N}\_}$;

4th on $\overset{\text{NM}}{\text{M}\_}$.

Aa2 is used on tone Ri. The interval size is:

3rd (x2) on $\overset{\text{MRMR}}{\text{R}\_\_\_}$.

Ab1 is used on tone Ri only. The interval size is:

3rd on $\overset{\text{MRM}}{\text{R}\_\_}$.

Ad1 is used on tone Ri only. The interval size is:

3rd (x2) on $\overset{\text{MR\_MR\_M}}{\text{R}\_\_\_\_\_\_}$.

Two type-B gamakas are used.

Ba2 is used on tones Sa and Ni. The interval size is:

SNS
2nd on S__;

NPN
3rd on N__.

Bb1 is used on tone Ni only. The interval size is:

NPNPN
3rd (x2) on N____.

Six type-C gamakas are used.

Ca1 is used on all five tones. The interval size is:

NS SR
2nd on S_, R_;

NR RM PN
3rd on R_, M_, and N_;

PS SM MN
4th on S_, M_, and N_.

Ca2 is used on tone Ni only. The interval size is:

PNPN
3rd (x2) on N___.

Cb1 is used on tone Ni only. The interval size is:

MNPN
4th and 3rd on N___.

Cf1 is used on tones Ri and Ni. The interval size is:

SMR
4th and 3rd on R__;

PSN
4th and 2nd on N__.

Cf2 is used on tone Ni only. The interval size is:

PSNSN
4th and 2nd (x2) on N____.

Ch1 is used on tone Ni only. The interval size is:

PNN
3rd and prime on N__.

Three type-D gamakas are used.

Da1 is used on tone Pa only. The interval size is:

PN
2nd on N_.

Db1 is used on tones Ri and Ni. The interval size is:

NSN
2nd on N__;

RMR
3rd on R__.

Df2 is used on tone Ri only. The interval size is:

R_MR_MR_M
3rd (x3) on R________.

Accent-E is used on tones Ri and Ma.

Accent-F is used on all five tones.

Stylistic-G is used on tones Sa, Ri, Pa, and Ni. The interval size is:

RS SN
2nd on S_ and N_;

MR NP
3rd on R_ and P_.

Stylistic-H is used on all five tones. The interval size is:

NS SR MP
2nd on S_, R_, and P_;

RM
3rd on M_;

MN
4th on N_.

Double ornaments are used on tone Ni only.

Table 6.1 shows that a total of 273 tones were used by the performer, of which 66% received some kind of ornament and 34% had no ornament. Of the 273, 48% were tones with gamaka, 3% were tones with accent, 15% were tones with stylistic, and 1% were tones with double ornament.

The tone Ni is heavily ornamented (92% Ni). The tones Ri and Ma are the next highest (74% Ri, 66% Ma). The tones Sa and Pa are ornamented approximately half of the time (50% Sa, 46% Pa).

In Table 6.2, it can be seen that types Aal, Cal, and stylistics account for a larger proportion of ornaments than any other types (35.9% Aal, 16.6% Cal, 23.8% stylistics). Some tones receive more of a given gamaka than do others. Of the total 65 type Aal, the tone Ni receives 30. Of the total 30 type Cal, the tone Ni also receives highest number (Ni 19). Of the stylistics, tones Sa and Pa receive more than any other tones (16 Sa, 13 Pa).

More varieties of type-A gamakas occur on tone Ri than on other tones; more type-C on tone Ni; type-D is spread thinly over tones (Ri, Ma, and Ni); and type-B is used rarely on two tones (Sa and Ni). Accent-E is used mostly on tone Ri. Accent-F occurs only once (on Ma). Stylistic-G is used more than stylistic-H (32 and 11 respectively). A double ornament is found on tone Ni only.

Table 6.3 shows that of the total 273 tones, 7% are held tones. The held tones are Sa, Ri, and Pa. The tone Sa is found in both middle and high range, Pa in middle range only. Among the held tones, Sa has the highest percentage (14%), next is tone Pa (11%), and tone Ri is (5%).

Table 6.1
Percentage Distribution of Tones and Gamakas:
Rāga III, Performer 1

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(16)	25			(16)	25			(32)	50	(32)	50	100%	(64)
Ri	(32)	56	(5)	9	(5)	9			(42)	74	(15)	26	100%	(57)
(Ga)														
Ma	(17)	51	(2)	6	(3)	9			(22)	66	(11)	33	100%	(33)
Pa	(12)	22			(13)	24			(25)	46	(29)	54	100%	(54)
(Da)														
Ni	(53)	82			(5)	7	(2)	3	(60)	92	(5)	8	100%	(65)
Total	(130)	48	(7)	3	(42)	15	(2)	1	(181)	66	(92)	34	100%	(273)

Table 6.2

Joint Distribution of Tones and Gamakas:
Rāga III, Performer 1

Gamaka Type		Sa	Ri	(Ga)	Ma	Pa	(Da)	Ni	Sum of Type	%
Aa1	\	6	11		13	5		30	65	35.9
a2	\/\		1						1	.5
b1	ɣ		7						7	3.9
d1	\/_		1						1	.5
Ba2	v	1						2	3	1.7
b1	w							1	1	.5
Ca1	/	9	4		4	6		7	30	16.6
a2	/\/							1	1	.5
b1	/\/							1	1	.5
f1	/\		1					5	6	3.3
f2	/\/\							1	1	.5
h1	/‾							4	4	2.2
Da1	/					1			1	.5
b1	^		5					1	6	3.3
f2	_/\/\		2						2	1.1
Gamaka Total		16	32		17	12		53	130	71.8
E	•		5		1				6	3.3
F	_				1				1	.5

Table 6.2 (Continued)

Joint Distribution of Tones and Gamakas:
Rāga III, Performer 1

Gamaka Type		Sa	Ri	(Ga)	Ma	Pa	(Da)	Ni	Sum of Type	%
Accent Total			5		2				7	3.9
G	Y	12	3			12		5	32	17.7
H	λ	4	2		3	1		1	11	6.1
Stylistic Total		16	5		3	13		6	43	23.8
Double Ornaments								1	1	.5
Grand Total		32	42		22	25		60	181	100.0

Table 6.3

Distribution of Held Tones
Rāga III, Performer 1

Tone	Frequency of Tones	Range: Low Unornamented	Range: Low Ornamented	Range: Middle Unornamented	Range: Middle Ornamented	Range: High Unornamented	Range: High Ornamented	Total	%
Sa	64			5	1	2	1	9	14
Ri	57				1	1	1	3	5
(Ga)									
Ma	33								
Pa	54	1		4	1			6	11
(Da)									
Ni	65								
Total	273	1		9	3	3	2	18	7

Rāga III, Performer 5

Principal Melody: Female Singer

Performer: D. K. Pattammal

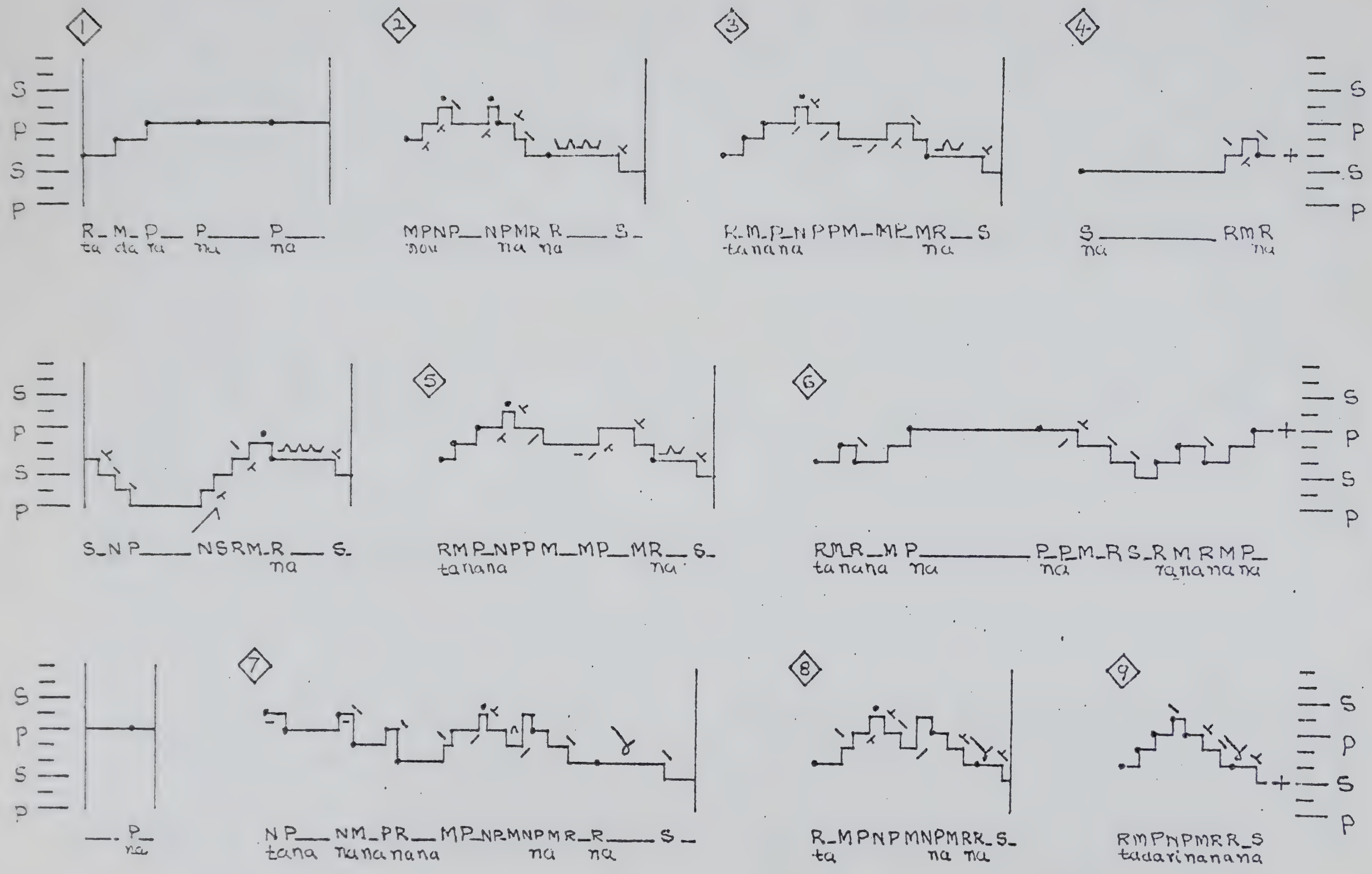
Melodic Accompaniment: Violin

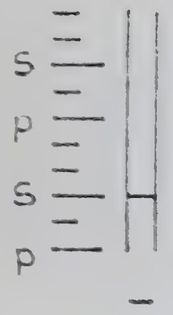
Drone Accompaniment: Tambūra

Performance Duration: 3 minutes, 26.6 seconds

Disc Source: CARNATIC SONGS by Smt. D. K. PATTAMMAL
EMI (Columbia) S/33 SEX 6048

Extract From:
- Kriti: "Parthasaradhi"
- Rāga: Madhyamāvati
- Tāla Ādi
- Language: Telugu
- Composer: Ramanathapuram Srinivara Iyengar


1
2
3
4
S
P
S
P
R_M_P__ P___ P___
ta da ra na na
MPNP__NPMR R___ S_
nou na na
R_M_P_NPPM_MP_MR__S
tanana na
S__________RMR
na na
5
6
RMP_NPPM__MP__MR__S_
tanana na
S_NP____NSRM_R___S_
na
RMR_MP__________P_P_M_RS_RMRMP_
tanana na na ranana na
7
8
9
__P_
na
NP___NM_PR__MP_NRMNPMR_R____S_
tana nananana na na
R_MPNPMNPMRR_S_
ta na na
RMPNPMRR_S
tadarinanana



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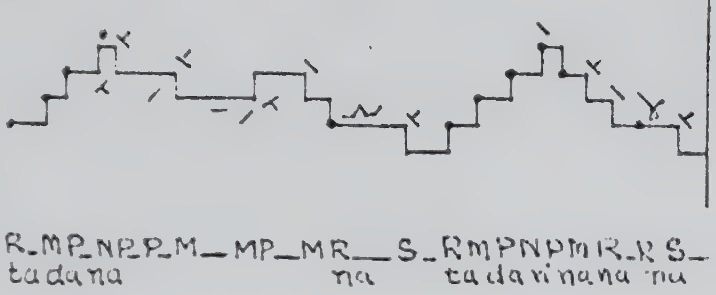
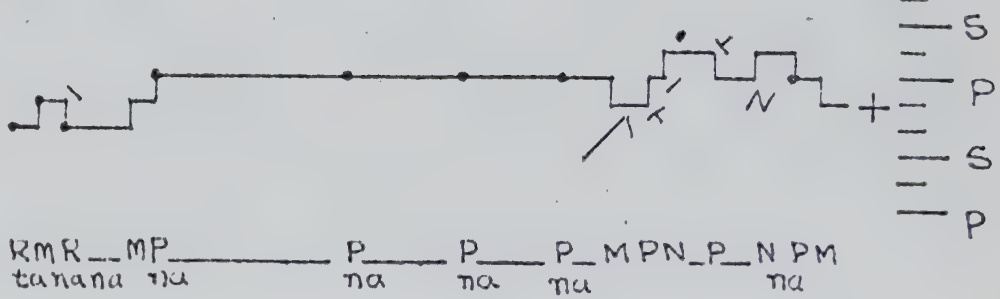
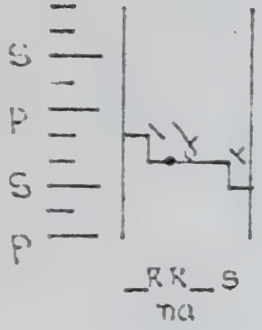

R_MP_NP_P_M_MP_MR__S_RMPNPMR_R S_
tadana na tadarinana na

11


RMR__MP________P____P____P_MPN_P_N PM
tanana na na na na na
S
P
S
P



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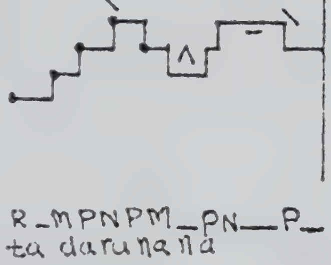
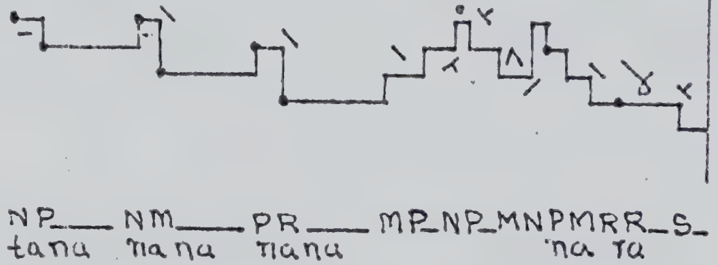
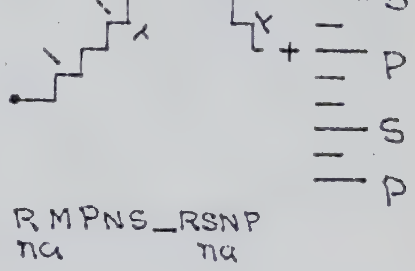
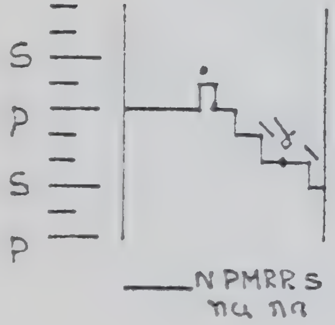

R_MPNPM_PN__P_
ta darunana

13

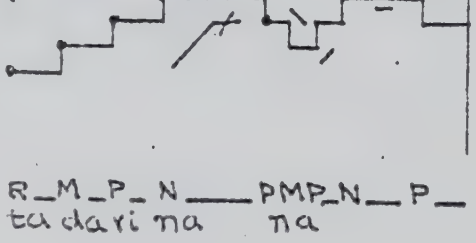

NP___NM___PR___MP_NP_MNPMRR_S_
tana nana nana na ra

14

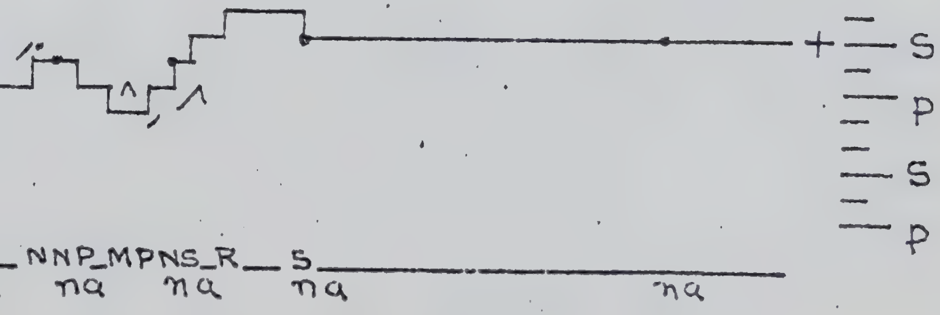

RMPNS_RSNP
na na
S
P
S
P

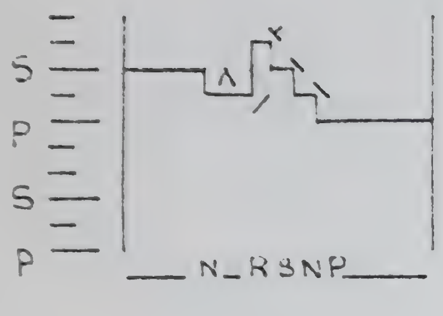

S
P
S
P
____NPMRRS
na na

15


R_M_P_N___PMP_N__P_
tadari na na

16


P__NNP_MPNS_R__S__________________
na na na na na
S
P
S
P



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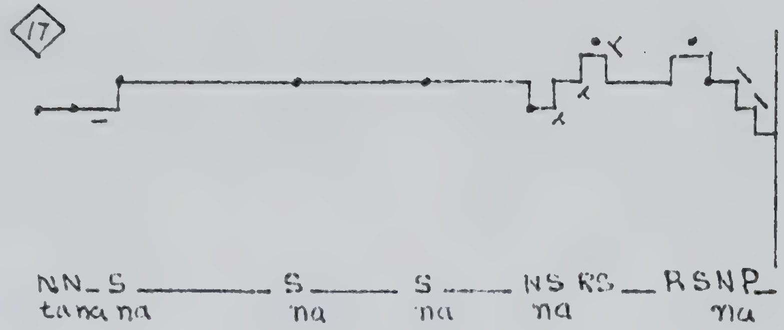
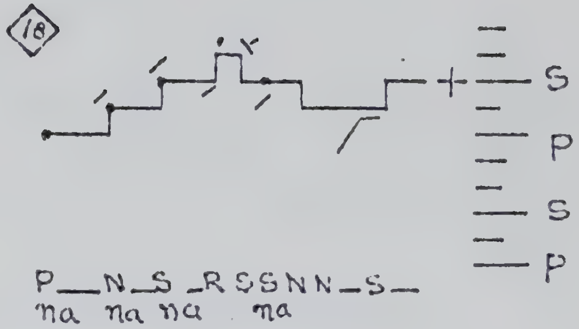
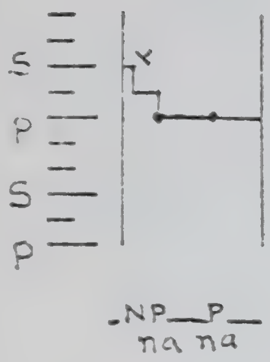
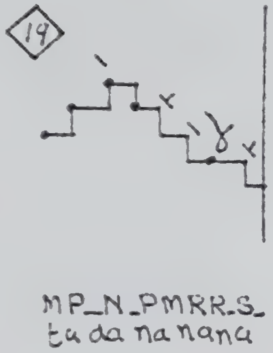

NN_S S S NS RS _RSNP_
tanana na na na na

18

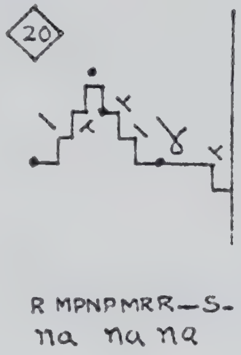

P_N_S_RSSNN_S_
na na na na
+
S
P
S
P


S
P
S
P
-NP_P_
na na

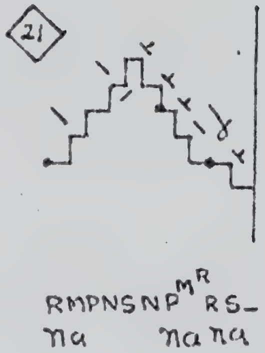
19


MP_N_PMRR.S_
tu da na nana

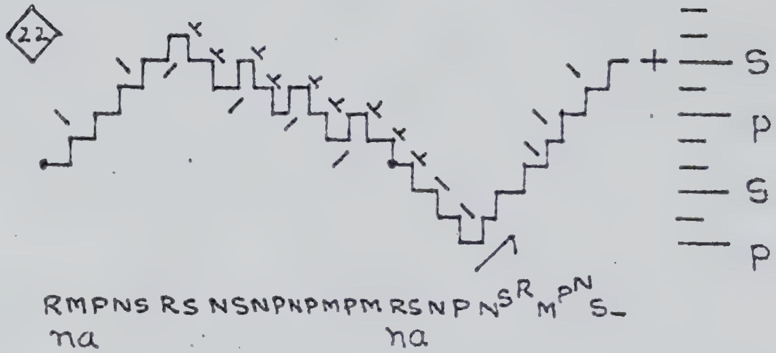
20

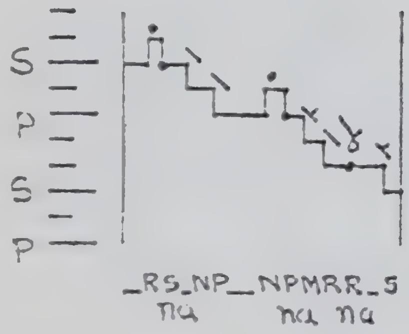

R MPNPMRR_S-
na na na

21

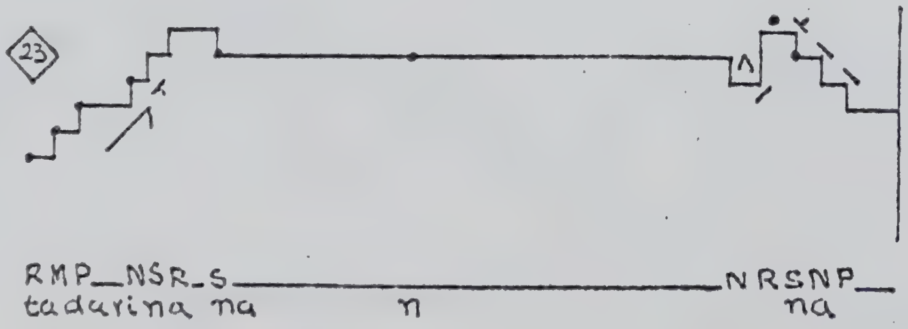

RMPNSNP^M^R RS_
na na na

22

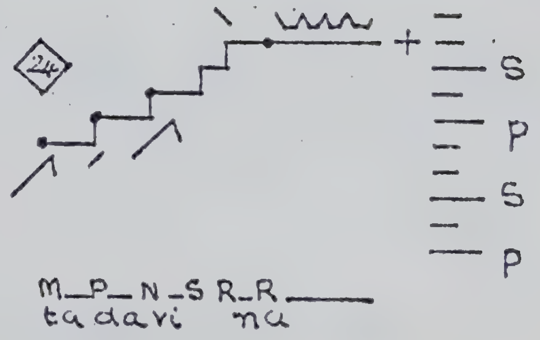

RMPNS RS NSNPNPMPM RSNPN^S^R M^P^N S_
na na
+
S
P
S
P

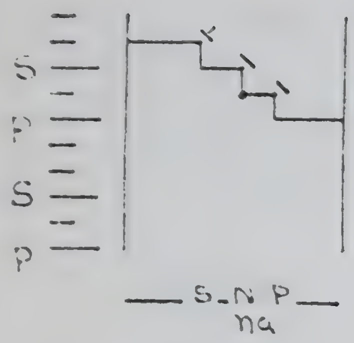

S
P
S
P
_RS_NP_NPMRR_S
na na na

23


RMP_NSR_S NRSNP_
tadarina na n na

24


M_P_N_S R_R
ta da ri na
+
S
P
S
P



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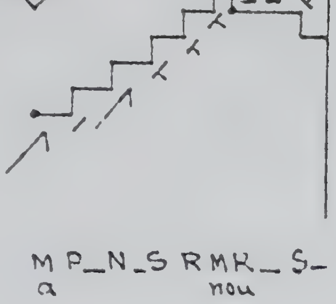
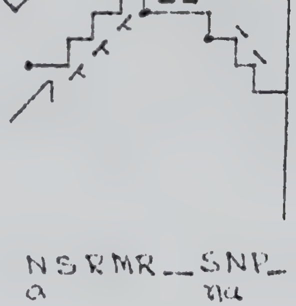
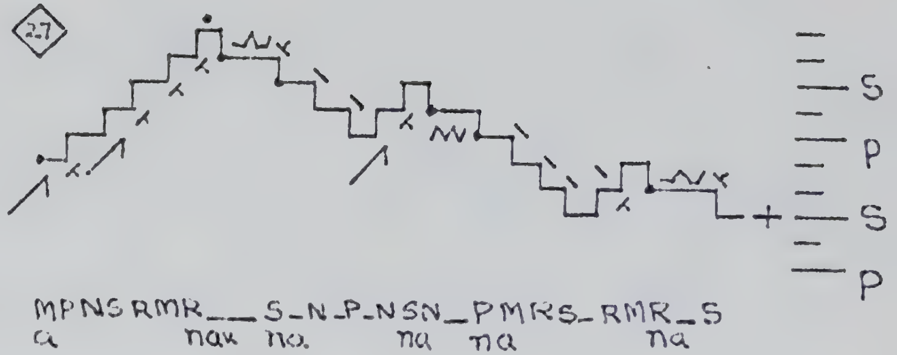

M P_N_S RMR_ S-
a nou

26


N S RMR __ SNP_
a na

27


+
S
P
S
P
MPNSRMR___S_N_P_NSN_PMRS_RMR_S
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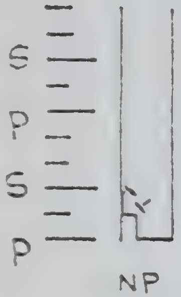

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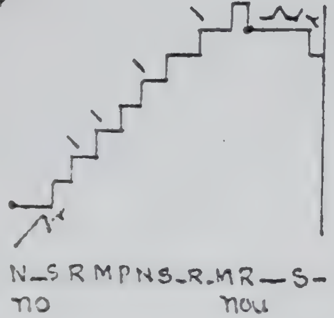
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no nou

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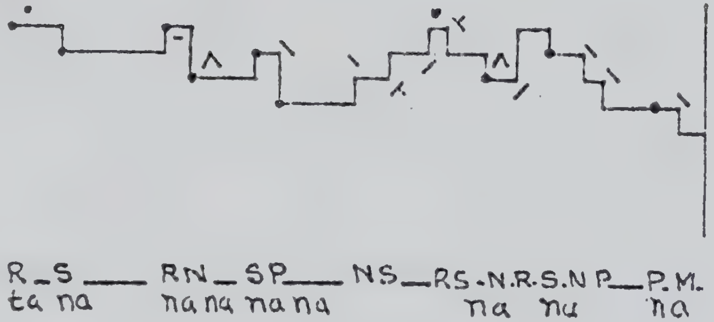
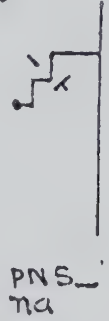

R _ S ___ RN _ SP___ NS__RS.N.R.S.N P__P.M.
ta na na na na na na na na

30



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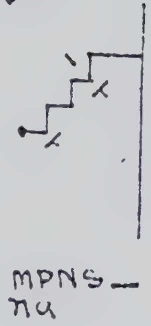

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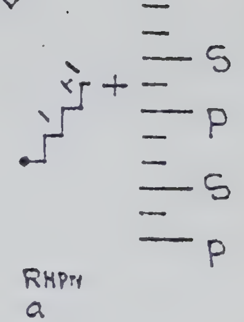

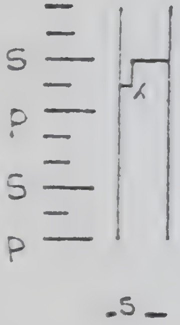

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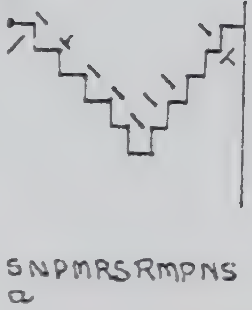
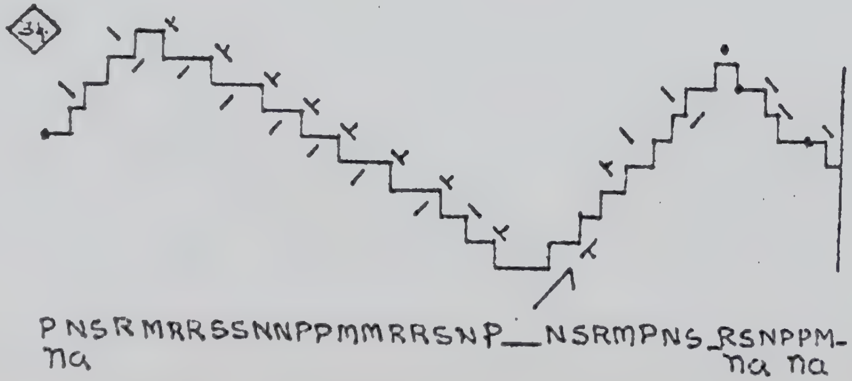

SNPMRSRMPNS
a

34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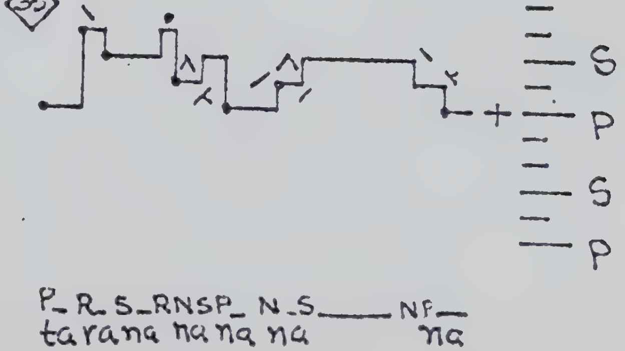
na na na

35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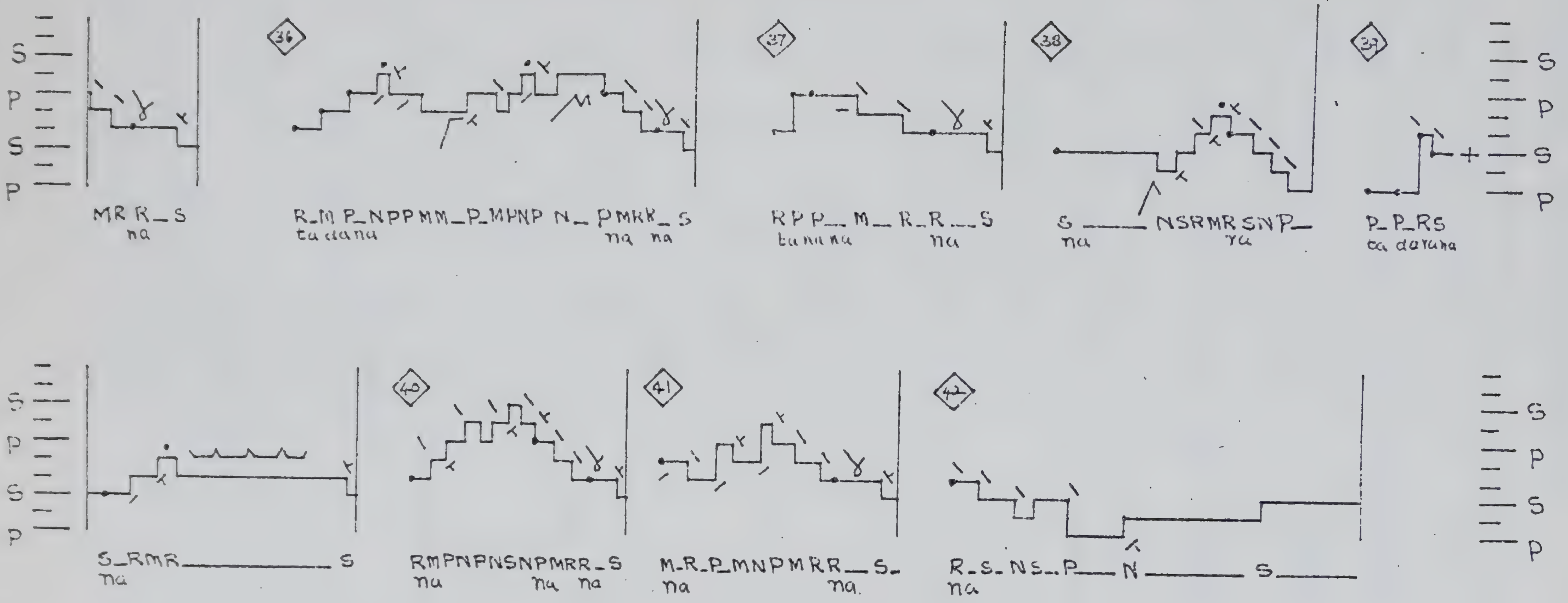
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tu nu na na
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S ____ NSRMR SNP_
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P_P_RS
ta darana
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S_RMR ________ S
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RMPNPNSNPMRR_S
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M_R_P_MNPMRR__S_
na na.
㊷
R_S_NS_P__N ______ S ______
na
S
P
S
P

Performance: Rāga III, Performer 5

The total duration of the performance as it appears on the transcription is 209.1 seconds, of which the soloist occupies 161.1 seconds. Silence in the soloist's part, during which the accompaniment continues, occupies 48.0 seconds. There are 42 phrases in total. The range of this performance is from low Pa to high Ma (two octaves). This performance starts on middle Ri and ends on middle Sa.

The performer, D. K. Pattammal, uses 20 types of ornaments, including gamakas, accents, stylistics, and some double ornaments. Four type-A gamakas are used.

Aa1 is used on all five tones Sa, Ri, Ma, Pa, and Ni. The interval size is:

2nd on $\overset{RS}{S\_}$, $\overset{PM}{M\_}$, and $\overset{SN}{N\_}$;

3rd on $\overset{MR}{R\_}$ and $\overset{NP}{P\_}$;

4th on $\overset{PR}{R\_}$ and $\overset{SP}{P\_}$.

Ab1 is used on tone Ri only. The interval size is:

3rd on $\overset{MRM}{R\_\_}$.

Ad2 is used on tone Ri. The interval size is:

3rd (x3) on $\overset{MR\_MR\_MR\_M}{R\_\_\_\_\_\_\_\_\_}$.

Ad3 is used on tone Ri only. The interval size is:

3rd (x4) on $\overset{MR\_MR\_MR\_MR\_M}{R\_\_\_\_\_\_\_\_\_\_\_\_}$.

Seven type-C gamakas are used.

Ca1 is used on all five tones. The interval size is:

2nd on $\overset{\text{NS}}{\text{S\_}}$, $\overset{\text{SR}}{\text{R\_}}$, and $\overset{\text{MP}}{\text{P\_}}$;

3rd on $\overset{\text{NR}}{\text{R\_}}$, $\overset{\text{RM}}{\text{M\_}}$, and $\overset{\text{PN}}{\text{N\_}}$;

4th on $\overset{\text{PS}}{\text{S\_}}$, $\overset{\text{SM}}{\text{M\_}}$, $\overset{\text{RP}}{\text{P\_}}$, and $\overset{\text{MN}}{\text{N\_}}$.

Ca2 is used on tone Ni. The interval size is:

3rd (x2) on $\overset{\text{PNPN}}{\text{N\_\_\_}}$.

Ca3 is used on tone Ni only. The interval size is:

3rd (x3) on $\overset{\text{PNPNPN}}{\text{N\_\_\_\_\_}}$.

Cf1 is used on tones Ma and Ni. The interval size is:

4th and 2nd on $\overset{\text{RPM}}{\text{M\_\_}}$ and $\overset{\text{PSN}}{\text{N\_\_}}$.

Cf2 is used on tone Ni only. The interval size is:

4th and 2nd (x2) on $\overset{\text{PSNSN}}{\text{N\_\_\_\_}}$.

Ch1 is used on tone Ma and Ni. The interval size is:

3rd and prime on $\overset{\text{RMM}}{\text{M\_\_}}$ and $\overset{\text{PNN}}{\text{N\_\_}}$.

Ch2 is used on tone Ni only. The interval size is:

3rd and prime (x2) on $\overset{\text{PNNN}}{\text{N\_\_\_}}$.

Four type-D gamakas are used.

Da1 is used on tones Sa, Pa, and Ni. The interval size is:

2nd on $\overset{\text{SR}}{\text{S\_}}$ and $\overset{\text{NS}}{\text{N\_}}$;

3rd on $\overset{\text{PN}}{\text{P\_}}$.

Dbl is used on tones Ma and Ni. The interval size is:

2nd on $\overset{\text{MPM}}{\text{M\_\_}}$ and $\overset{\text{NSN}}{\text{N\_\_}}$.

Dfl is used on tone Ri only. The interval size is:

3rd (x2) on $\overset{\text{R\_MR\_M}}{\text{R\_\_\_\_\_}}$.

Df3 is used on tone Ri only. The interval size is:

3rd (x4) on $\overset{\text{R\_MR\_MR\_MR\_M}}{\text{R\_\_\_\_\_\_\_\_\_\_\_}}$.

Accent-E is used on tones Ri and Ni.

Accent-F is used on tones Ri, Ma, Pa, and Ni.

Stylistic-G is used on all five tones. The interval size is:

2nd on $\overset{\text{RS}}{\text{S\_}}$, $\overset{\text{PM}}{\text{M\_}}$, and $\overset{\text{SN}}{\text{N\_}}$;

3rd on $\overset{\text{MR}}{\text{R\_}}$ and $\overset{\text{NP}}{\text{P\_}}$.

Stylistic-H is used on all five tones. The interval size is:

2nd on $\overset{\text{NS}}{\text{S\_}}$, $\overset{\text{SR}}{\text{R\_}}$, and $\overset{\text{MP}}{\text{P\_}}$;

3rd on $\overset{\text{RM}}{\text{M\_}}$ and $\overset{\text{PN}}{\text{N\_}}$.

Double ornaments are used on tones Ri, Ga, Pa, and Da.

Table 6.4 shows that a total of 531 tones were used by performer, of which 73% received some kind of ornament and 27% had no ornament. Of the 531, 43% were tones with gamaka, 4% were tones with accent, 21% were tones with stylistic, and 5% were tones with double ornament.

The tone Ni is almost always ornamented (97% Ni). The tones Ri, Sa and Ma are the next highest (79% Ri; 72% Sa and Ma). The tone Pa is ornamented approximately half of the time (48% Pa).

Table 6.4
Percentage Distribution of Tones and Gamakas: Rāga III, Performer 5

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(16)	17			(53)	55			(69)	72	(27)	28	100%	(96)
Ri	(72)	62	(7)	6	(9)	8	(4)	3	(92)	79	(24)	21	100%	(116)
(Ga)														
Ma	(44)	47	(2)	2	(15)	16	(7)	7	(68)	72	(26)	28	100%	(94)
Pa	(30)	23	(1)	1	(30)	23			(61)	48	(66)	52	100%	(127)
(Da)														
Ni	(67)	68	(9)	9	(6)	6	(13)	13	(95)	97	(3)	3	100%	(98)
Total	(229)	43	(19)	4	(113)	21	(24)	5	(385)	73	(146)	27	100%	(531)

In Table 6.5, it can be seen that types Aa1, Ca1, and stylistics account for a larger proportion of ornaments than any other types (32.7% Aa1, 10.4% Ca1, and 29.4% stylistics). Some tones receive more of a given gamaka than do others. Of the total 126 type Aa1, the tones Ri and Ni, Ma receive 37 and 28 respectively. Of the total 40 type Ca1, the tone Ni receives 23. Of the stylistics, the tones Sa and Pa receive more than any other tones (53 Sa and 30 Pa).

More varieties of type-A gamakas occur on tone Ri than on other tones; more type-C on tones Ni and Ma; type-D is used on all five tones but mostly on tones Ri and Ni and type-B is not used in this performance. Accent-E is used on tones (Ri and Ni) but accent-F is used on tones (Ri, Ma, Pa, and Ni). Both stylistic-G and stylistic-H are used on all five tones but stylistic-G is used more than H (80 and 33, respectively). Double ornaments are found on tones Ri, Ma, and Ni.

Table 6.6 shows that of the total 531 tones, 2% are held tones. The held tones are Sa, Ri, Pa, and Ni. The tone Sa is found in both middle and high range; the tones Ri and Pa are found in middle range; and the tone Ni is found in low range only. Among the held tones, Sa has the highest percentage (8%), next are tones Ri and Pa (2%), and tone Ni is (1%) only.

Table 6.5

Joint Distribution of Tones and Gamakas: Rāga III, Performer 5

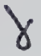
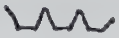
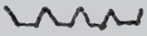
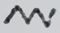
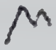
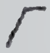
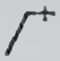
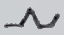
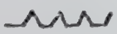
Gamaka Type		Sa	Ri	(Ga)	Ma	Pa	(Da)	Ni	Sum of Type	%
Aa1	\	7	37		28	17		37	126	32.7
b1			16						16	4.2
d2			1						1	.3
d3			2						2	.5
Ca1	/	8	7		7	12		6	40	10.4
a2								1	1	.3
a3								1	1	.3
f1	∧				4			12	16	4.2
f2								1	1	.3
h1					1			1	2	.5
h2								1	1	.3
Da1	/	1				1		1	3	.8
b1	^				4			6	10	2.6
f1			8						8	2.1
f3			1						1	.3
Gamaka Total		16	72		44	30		67	229	59.5
E	•		6					2	8	2.1
F	_		1		2	1		7	11	2.8

Table 6.5 (Continued)

Joint Distribution of Tones and Gamakas:
Rāga III, Performer 5

Gamaka Type		Sa	Ri	(Ga)	Ma	Pa	(Da)	Ni	Sum of Type	%
Accent Total			7		2	1		9	19	4.9
G	⋎	35	6		13	21		5	80	20.8
H	⋏	18	3		2	9		1	33	8.6
Stylistic Total		53	9		15	30		6	113	29.4
Double Ornaments			4		7			13	24	6.2
Grand Total		69	92		68	61		95	385	100.0

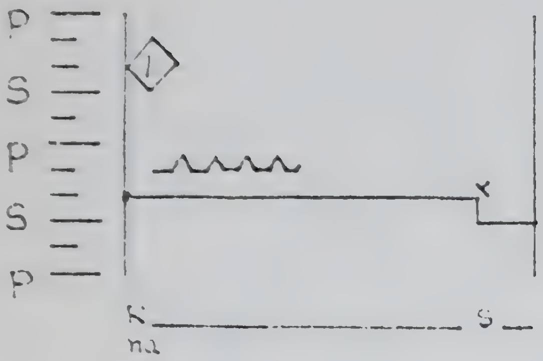
Table 6.6

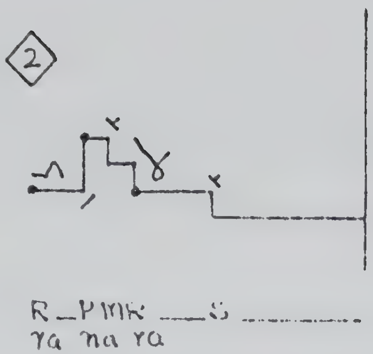
Distribution of Held Tones:
Rāga III, Performer 5

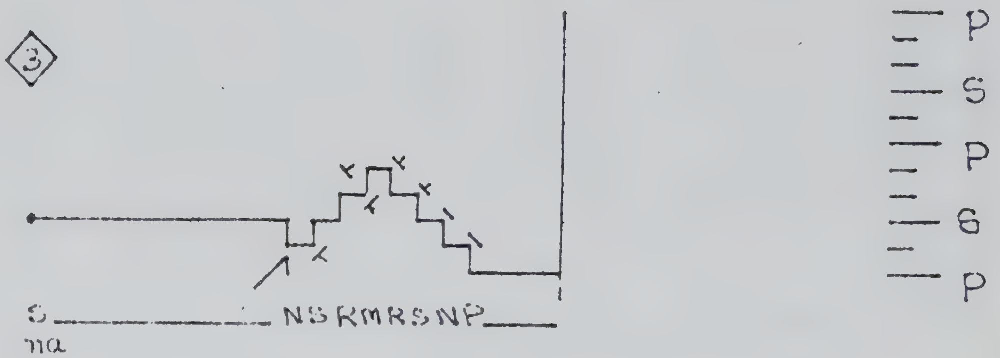
		Range							
		Low		Middle		High			
Tone	Frequency of Tones	Unornamented	Ornamented	Unornamented	Ornamented	Unornamented	Ornamented	Total	%
Sa	96			3		5		8	8
Ri	116				2			2	2
(Ga)									
Ma	94								
Pa	127			2				2	2
(Da)									
Ni	98		1					1	1
Total	531		1	5	2	5		13	2

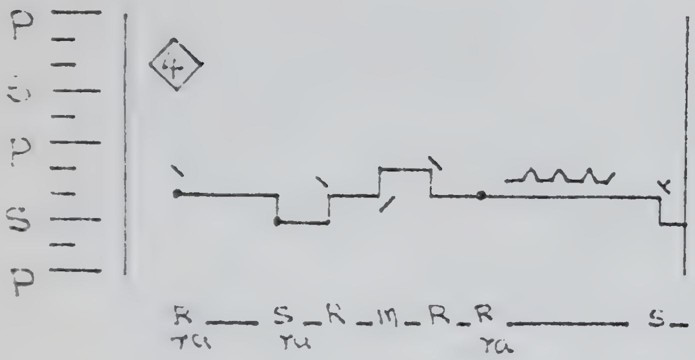
Rāga III, Performer 6

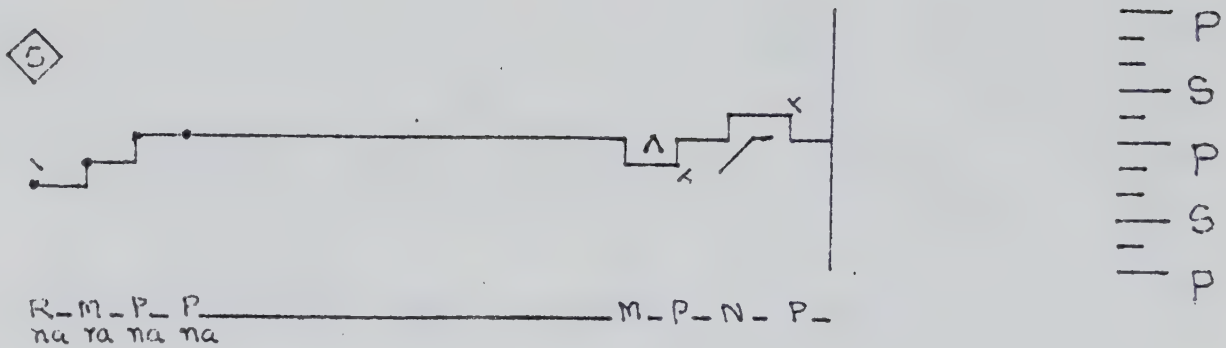
Principal Melody:	Male Singer	
Performer:	Ramnad Krishnan	
Melodic Accompaniment:	Violin	
Drone Accompaniment:	Tambūra	
Performance Duration:	4 minutes, 6.6 seconds	
Disc Source:	RAMNAD KRISHNAN: VIDWAN; SONGS OF THE CARNATIC TRADITION Nonesuch, Explorer Series HB-72023 (Stereo)	
Extract From:	Kriti:	"Pālincu Kāmāksi"
	Rāga:	Madhyamāvati
	Tāla:	Ādi
	Language:	Telugu
	Composer:	Syāmā Śāstri

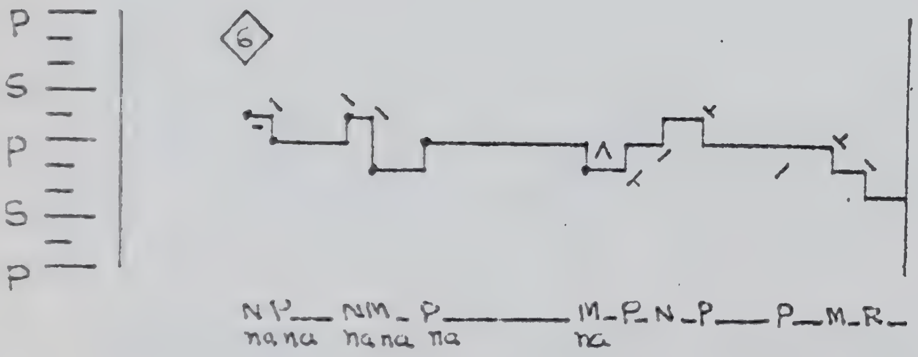

P
S
P
S
P
1
R_______________S__
na

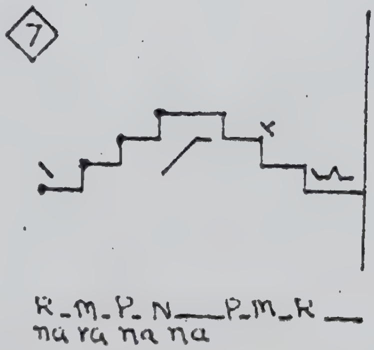

2
R_PMR___S_______
ra na ra

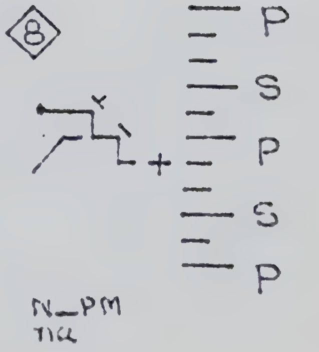

3
S______________NSRMRSNP_____
na
P
S
P
S
P


P
S
P
S
P
4
R___S_R_M_R_R_______S_
ra ra ra


5
R_M_P_P________________________M_P_N_P_
na ra na na
P
S
P
S
P


P
S
P
S
P
6
NP__NM_P_______M_P_N_P___P__M_R_
nana nana na na


7
R_M_P_N___P_M_R__
na ra na na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P
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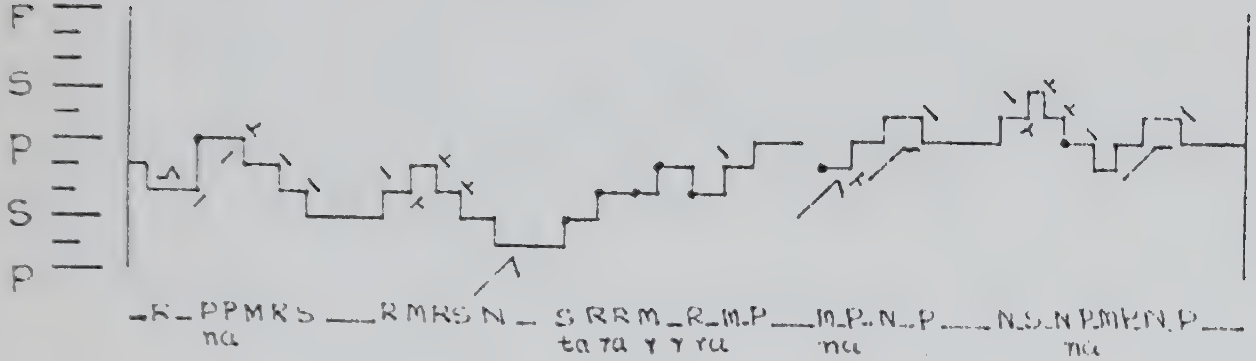
P
S
P


F
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-R_PPMRS ___RMRS N_ SRRM_R_M.P___M.P._N._P___N.S.N P.MRN.P___
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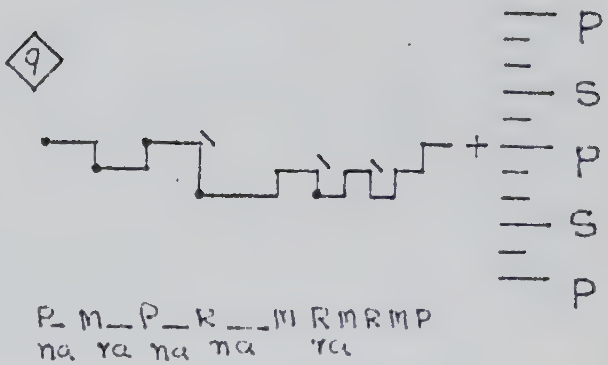
9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P_M_P_R___M RMRMP
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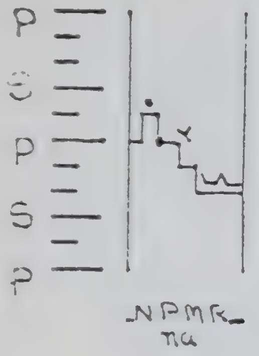
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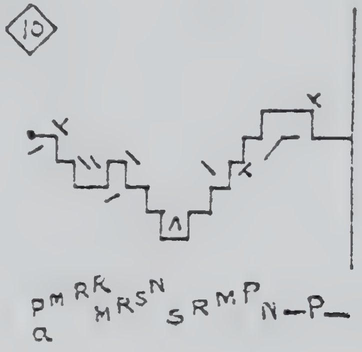
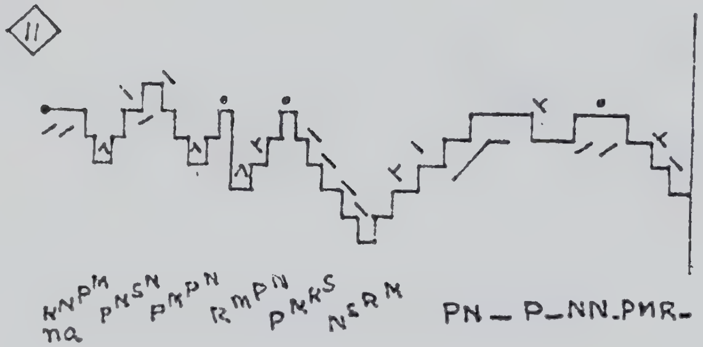
10


PM RR MRS N SRMP N-P-
a

11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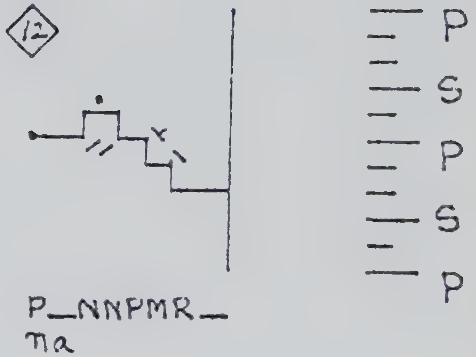
na

12


P
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S
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P_NNPMR_
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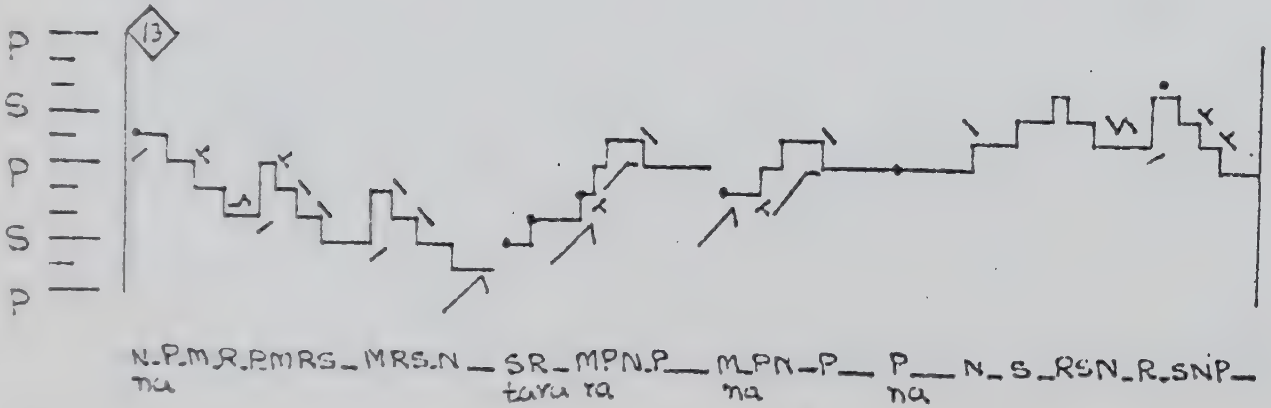
13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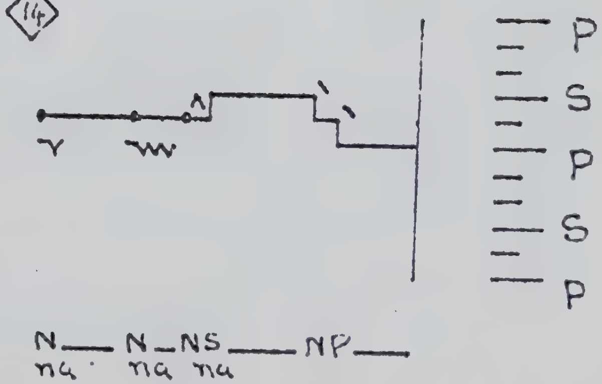
taru ra
na
na

14


P
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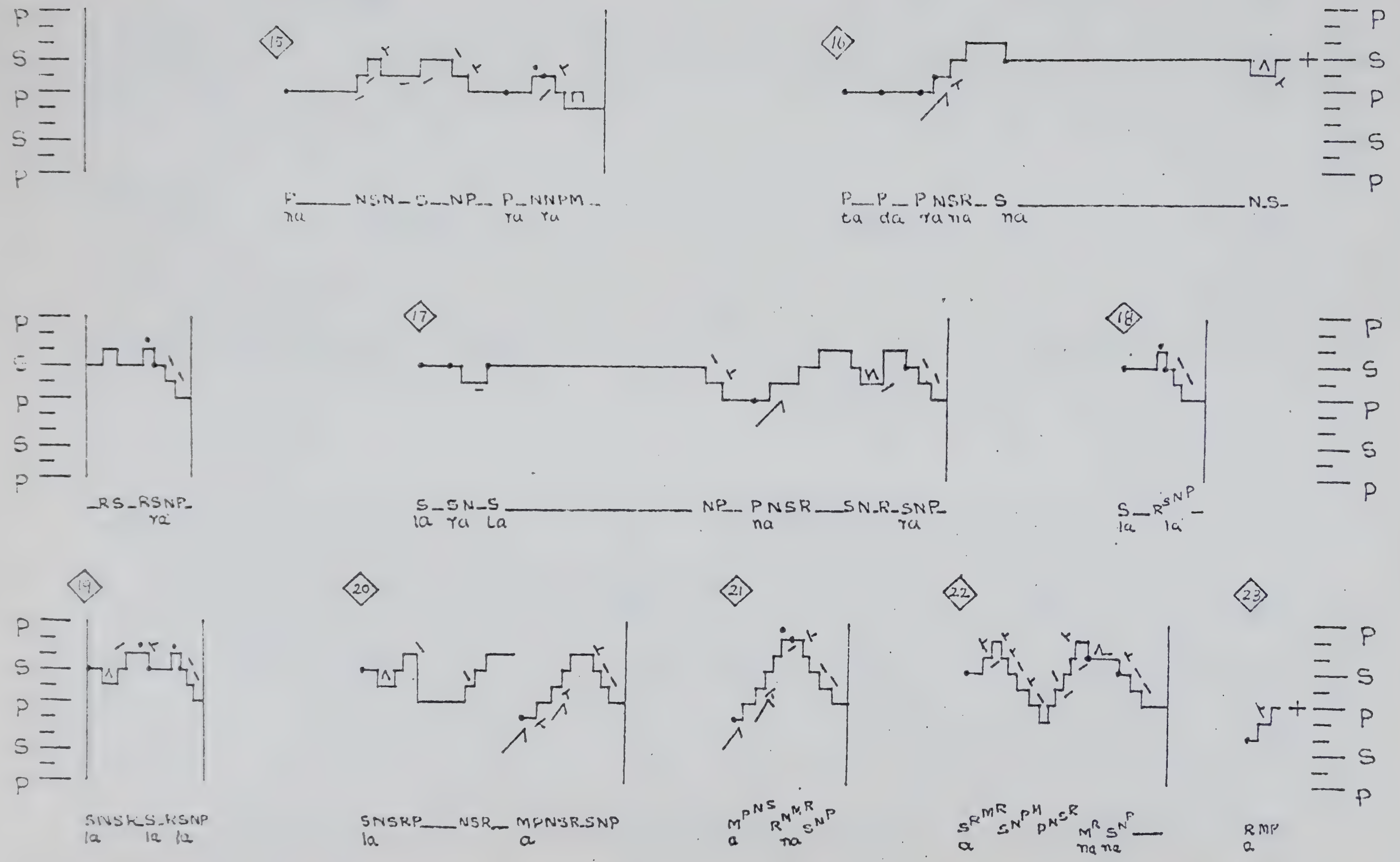
N__N_NS___NP___
na na na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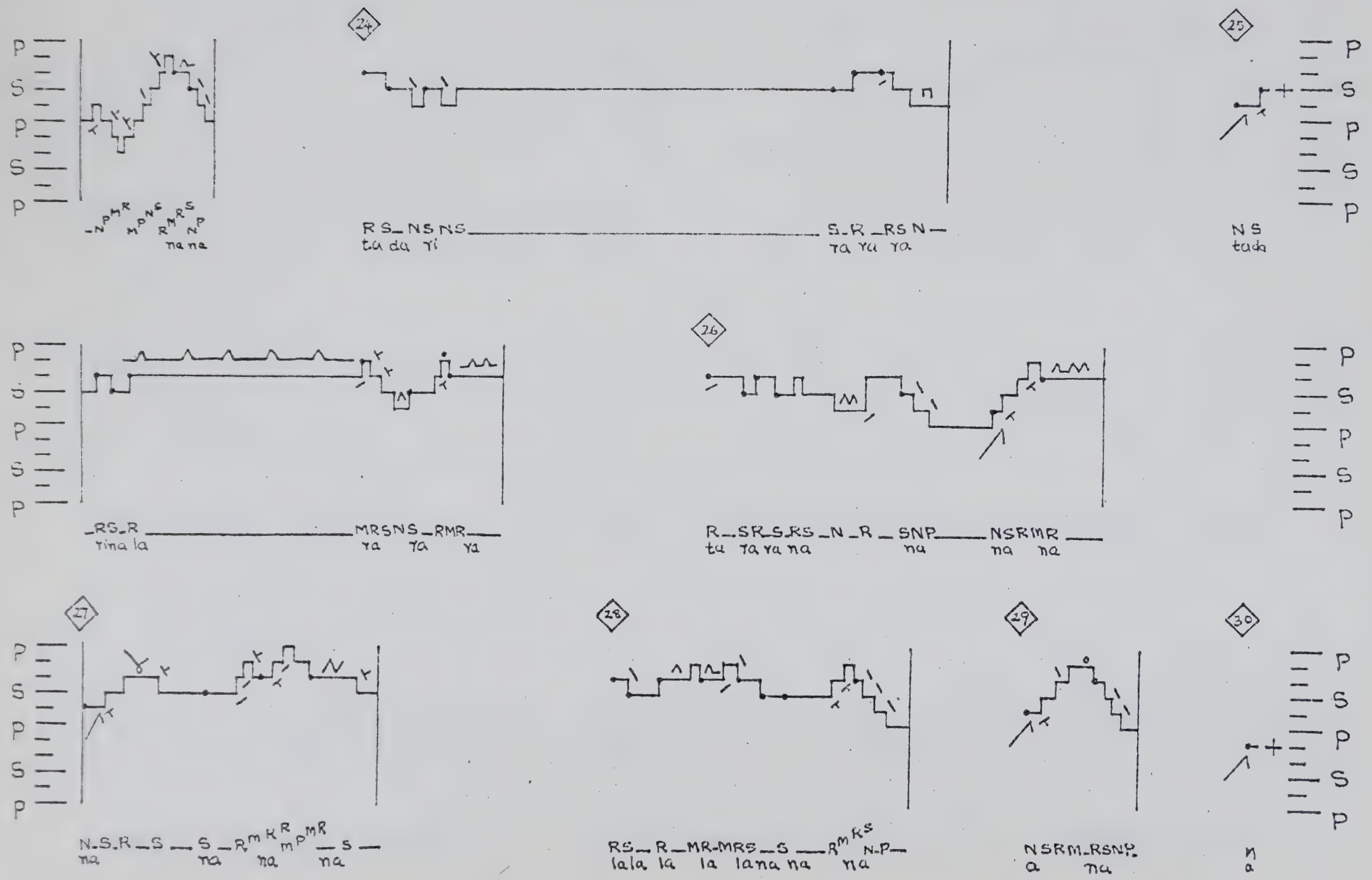
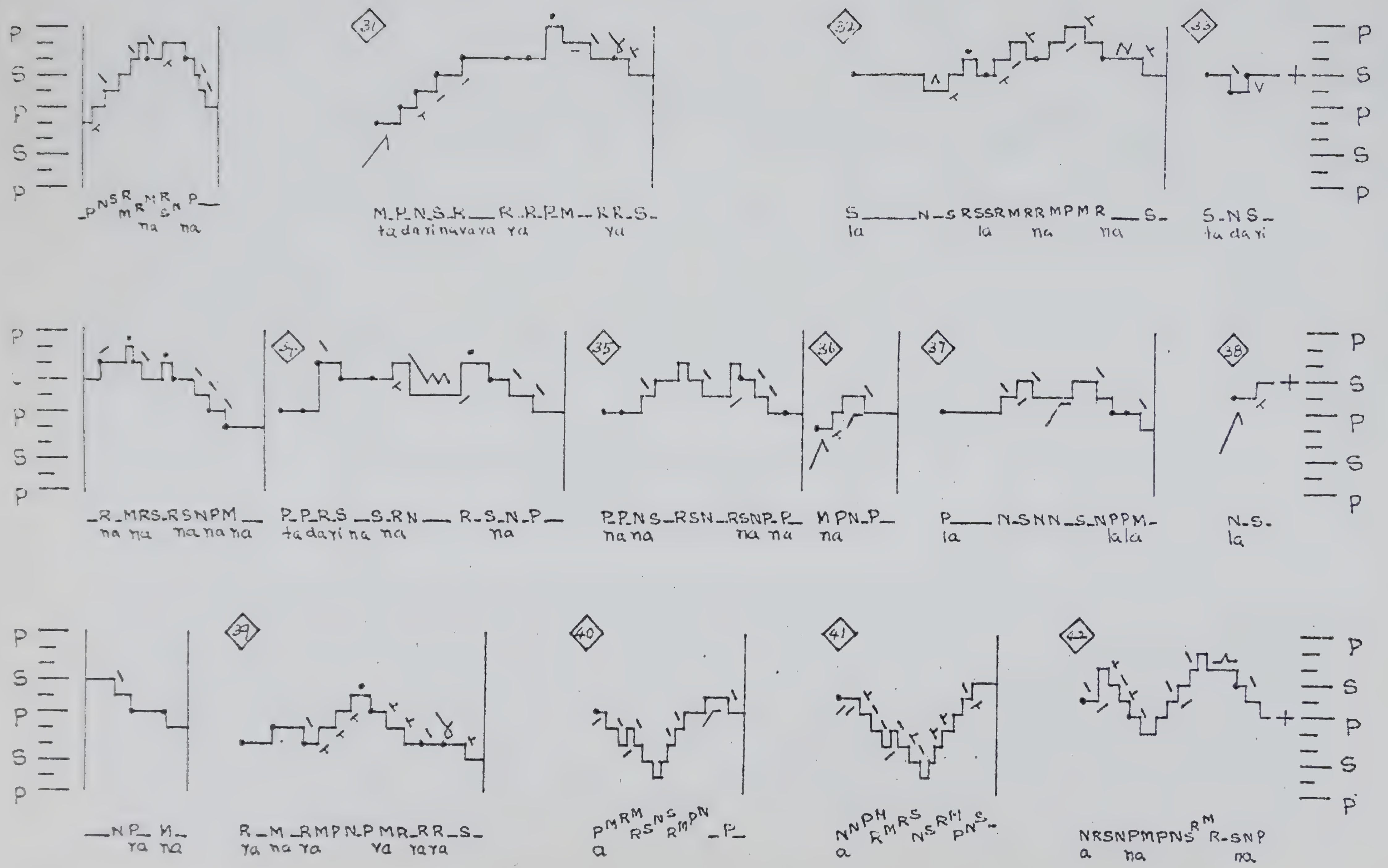
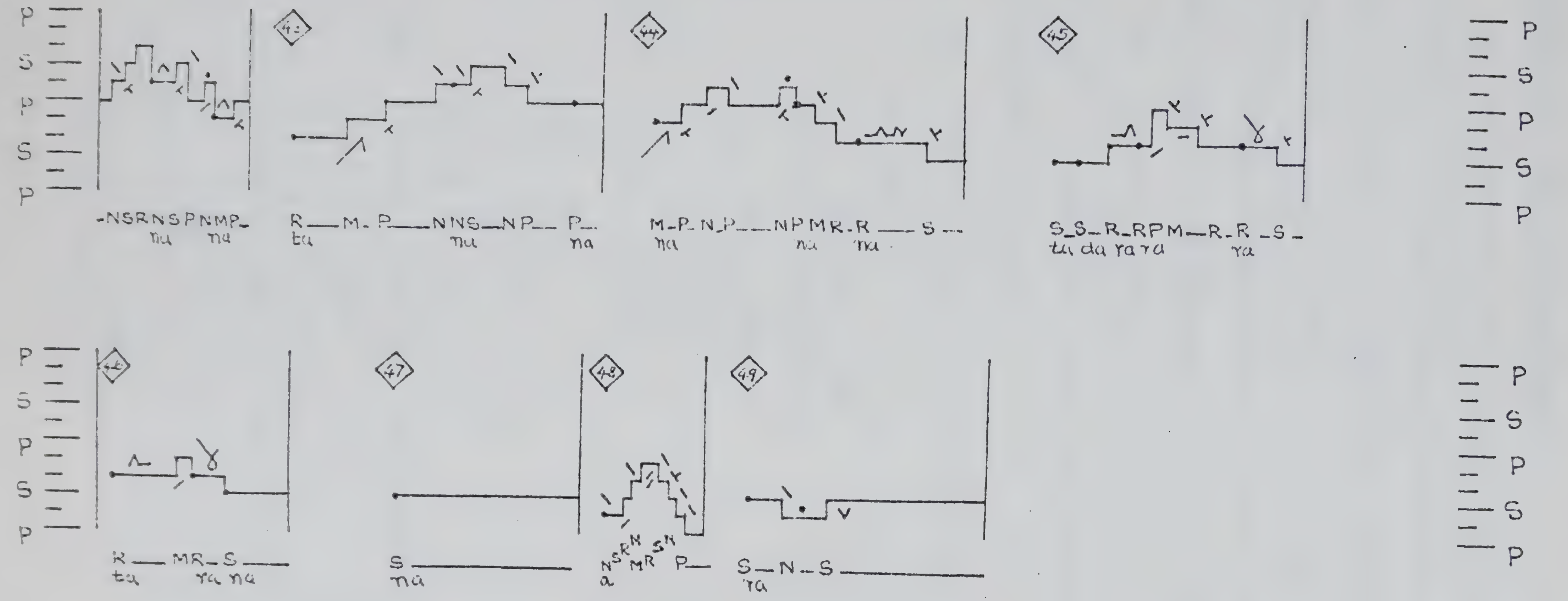
S
P
S
P
15
P____NSN–S__NP__ P_NNPM__
na ra ra
16
P__P__P NSR__S ____________N.S–
ta da ra na na
+
P
S
P
S
P
_RS_RSNP_
ra
17
S_SN_S ____________ NP__ PNSR___SN.R_SNP_
la ra la na ra
18
S_RSNP –
la la
19
SNSRS_RSNP
la la la
20
SNSRP____NSR__ MPNSR.SNP
la a
21
MPNS RNMR SNP
a na
22
SRMR SNPH PNSR MR SNP ____
a na ne
23
RMP
a


P S P S P
-N P M R M P N S R M R S N P
na na
24
RS_NSNS
ta da ri
S_R _RSN—
ra ru ra
25
P S P S P
NS
tada
P S P S P
_RS_R
rina la
MRSNS_RMR
ra ra ra
26
R_SR_S_RS_N_R _ SNP
tu ra ra na na
NSRMR
na na
P S P S P
27
P S P S P
N.S.R _S — S _R m K R m P M R — S —
na na na na
28
RS_ R_MR-MRS_S __R m K S N-P—
lala la la lana na na
29
NSRM_RSNP
a na
30
P S P S P
n
a


P
S
P
S
P
_PNSR MR NR SN P__
na na
31
M_P_N_S_R__R_R_P_M__R R_S_
tadarinavara ra ra
32
S____N_S R S S R M R R M P M R ___ S_
la la na na
33
S_N S_
tadari
R_MRS_RSNPM__
na na nanana
34
P_P_R_S _S_R N___ R_S_N_P__
tadarina na na
35
P_P_N S_R S N_R S N P_P_
na na na na
36
M P N_P_
na
37
P____N_S N N_S_N P P M_
la kala
38
N_S_
la
__N P_ M_
ra na
39
R_M_R M P N_P M R_R R_S_
ra na ra ra rara
40
P M R M RS NS RM PN _P_
a
41
N N PH RM RS NS RM PN S_
a
42
N R S N P M P N S R M R_S N P
a na na


P
S
P
S
P
-NSRNSPNMP-
nu na
43
R — M. P — NNS — NP — P —
ta nu na
44
M-P-N-P — NPMR-R — S —
na na ra
45
S-S-R-RPM — R-R -S -
tu da ra ra ra
P
S
P
S
P
46
R — MR-S —
ta ra na
47
S —
na
48
NSRNMRSN P —
a
49
S — N-S —
ra

Performance: Rāga III, Performer 6

The total duration of the performance as it appears on transcription is 250.1 seconds, of which the soloist occupies 206.5 seconds. Silence in the soloist's part, during which the accompaniment continues, occupies 43.6 seconds. There are 49 phrases in total. The range of this performance is from low Pa to high Pa (two octaves). The performer starts the performance on middle Ri and ends on middle Sa.

The performer, Ramnad Krishnan, uses 30 types of ornaments, including gamakas, accents, stylistics, and some double ornaments. Five type-A gamakas are used.

Aa1 is used on all five tones, Sa, Ri, Ma, Pa, and Ni. The interval size is:

2nd on $\overset{\text{RS}}{\text{S\_}}$, $\overset{\text{PM}}{\text{M\_}}$, and $\overset{\text{SN}}{\text{N\_}}$;

3rd on $\overset{\text{MR}}{\text{R\_}}$ and $\overset{\text{NP}}{\text{P\_}}$;

4th on $\overset{\text{NM}}{\text{M\_}}$ and $\overset{\text{SP}}{\text{P\_}}$;

5th on $\overset{\text{RP}}{\text{P\_}}$;

6th on $\overset{\text{NR}}{\text{R\_}}$.

Aa2 is used on tone Ni. The interval size is:

2nd (x2) on $\overset{\text{SNSN}}{\text{N\_\_\_}}$.

Ab1 is used on tone Ri. The interval size is:

3rd on $\overset{\text{MRM}}{\text{R\_\_}}$;

4th and 3rd on $\overset{\text{PRM}}{\text{R\_\_}}$.

Ac3 is used on tone Ni. The interval size is:

RNSNSN
3rd and 2nd (x2) on N______.

Ae1 is used on tone Ri. The interval size is:

MR_MR_
3rd (x2) on R______.

Three type-B gamakas are used.

Ba2 is used on tone Sa. The interval size is:

SNS
2nd on S__.

Bc1 is used on tone Ni. The interval size is:

N_PN
3rd on N___.

Bc2 is used on tone Ni. The interval size is:

N_PNPNPN
3rd (x3) on N_______.

Three type-C gamakas are used.

Ca1 is used on all five tones. The interval size is:

NS SR MP
2nd on S_, R_, and P_;

NR RM PN
3rd on R_, M_, and P_;

SM RP PS
4th on M_, P_, and N_;

PR
5th on R_.

Cf1 is used on tones Ma and Ni. The interval size is:

RPM PSN
4th and 2nd on M__ and N__.

Ch1 is used on tone Ni. The interval size is:

PNN
3rd and prime on N__.

Thirteen type-D gamakas are used.

Da1 is used on tone Ri. The interval size is:

RM
3rd on R_.

Da2 is used on tone Ri. The interval size is:

RMRM
3rd (x2) on R___.

Db1 is used on tones Ri, Ma, and Ni. The interval size is:

NSN
2nd on N__;

RMR MPM
3rd on R__ and M__.

Db2 is used on tone Ni. The interval size is:

NSNSN
2nd (x2) on N____.

Dc1 is used on tone Ri. The interval size is:

RMR_MRMR
3rd (x3) on R_______.

Dd1 is used on tone Ri. The interval size is:

R_MR_MRM
3rd (x3) on R_______.

Df3 is used on tone Ri. The interval size is:

R_MR_MR_MR_M
3rd (x4) on R___________.

Df4 is used on tone Ri. The interval size is:

R_MR_MR_MR_MR_M
3rd (x5) on R______________.

Dg1 is used on tone Ri. The interval size is:

RMR
3rd on R__.

Dh1 is used on tone R also. The interval size is:

R_MR_
3rd on R____.

Dh2 is used on tone Ri. The interval size is:

R_MR_MR_MR_MR_MR_
3rd (x5) on R________________.

Di1 is used on tone Ri. The interval size is:

R_MR
3rd on R___.

Dj1 is used on tone Ma and Ni. The interval size is:

MP_M NS_N
2nd on M___ and N___.

Accent-E is used on tones Ri, Ma, Pa and Ni.

Accent-F is used on tones Ma and Ni.

Stylistic-G is used on all five tones Sa, Ri, Ma, Pa and Ni. The interval size is:

RS PM SN
2nd on S_, M_, and N_;

MR NP
3rd on R_ and P_.

Stylistic-H is used on all five tones. The interval size is:

NS SR MP
2nd on S_, R_, and P_;

RM PN
3rd on M_ and N_.

Double ornaments are used on tones Ri, and Da.

Table 6.7 shows that a total of 584 tones were used by the performer, of which 70% received some kind of ornament and 30% had no ornament. Of the 584, 46% were tones with gamaka, 2% were tones with accent, 20% were tones with stylistic, and 2% were tones with double ornament.

Table 6.7
Percentage Distribution of Tones and Gamakas:
Rāga III, Performer 6

Tone	Tones w/ Gamaka		Tones w/ Accent		Tones w/ Stylistic		Tones w/ Double Ornaments		Total Tones w/ Ornaments		Total Tones w/o Ornaments		All Tones	Base for Percent
Sa	(16)	13			(35)	28			(51)	41	(73)	59	100%	(124)
Ri	(74)	55	(5)	4	(18)	14	(3)	3	(100)	73	(33)	27	100%	(133)
(Ga)														
Ma	(42)	43	(4)	4	(26)	27	(2)	2	(74)	76	(23)	24	100%	(97)
Pa	(37)	33	(1)	1	(27)	24			(65)	58	(46)	42	100%	(111)
(Da)														
Ni	(99)	83	(6)	5	(7)	6	(7)	6	(119)	100			100%	(119)
Total	(268)	46	(16)	2	(113)	20	(12)	2	(409)	70	(175)	30	100%	(584)

The tone Ni is ornamented (100%). The tones Ri and Ma are ornamented the next highest (73% Ri, 76% Ma). The tones Pa and Sa are ornamented approximately half of the time (58% Pa, 41% Sa).

In Table 6.8, it can be seen that types Aal, Cal and stylistics account for a larger proportion of ornaments than any other types (32.3% Aal, 12.5% Cal, and 27.6% stylistics). Some tones receive more of a given gamaka than do others. Of the total 132 type Aal, the tones Ri and Ni received 38 and 49 respectively. Of the total 51 type Cal, all five tones receive some (8 Sa and $8, 14 Ma, 10 Pa, and 11 Ni). Of the stylistics, tones Sa, Ma, and Pa receive the highest (35, 26, and 27 respectively).

More varieties of type-A gamakas occur on tones Ri and Ni than on other tones; more type-C on tones Ma and Ni; larger variety of type-D is used on tone Ri; and type-B is used rarely on tones (Sa and Ni). Accent-E is used on more tones (Ri, Ma, Pa, and Ni) than accent-F (Ma and Ni).

Both stylistic-G and stylistic-H are used on all five tones but stylistic-G is used more than H (72 and 41, respectively). Double ornaments are found on tones Ri, Ma, and Ni.

Table 6.9 shows that of the total 584 tones, 2% are held tones. The held tones are Sa, Ri and Pa. The tones Sa and Ri are found both in middle and high range; Pa in middle range only. Among the held tones, Sa has the highest percentage (6%), next are tones Ri and Pa (2%).

Table 6.8

Joint Distribution of Tones and Gamakas: Rāga III, Performer 6

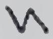
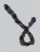
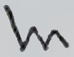
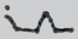
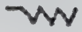
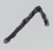
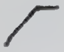
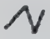
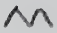
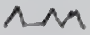
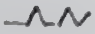
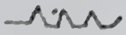
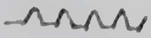
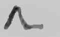
Gamaka Type		Sa	Ri	(Ga)	Ma	Pa	(Da)	Ni	Sum of Type	%
Aa1		6	38		12	27		49	132	32.3
a2								2	2	.5
b1			6						6	1.5
c3								1	1	.2
e1			2						2	.5
Ba2		2							2	.5
c1								1	1	.2
c2								1	1	.2
Ca1		8	8		14	10		11	51	12.5
f1					10			12	22	5.3
h1								12	12	2.9
Da1			1						1	.2
a2			2						2	.5
b1			2		5			8	15	3.7
b2								1	1	.2
c1			1						1	.2
d1			1						1	.2
f3			1						1	.2
f4			1						1	.2
g1			4						4	1.0

Table 6.8 (Continued)

Joint Distribution of Tones and Gamakas:
Rāga III, Performer 6

Gamaka Type		Sa	Ri	(Ga)	Ma	Pa	(Da)	Ni	Sum of Type	%
h1	_∧_		1						1	.2
h2	_∧∧_		1						1	.2
h3	_∧∧∧∧∧_		1						1	.2
i1	_∧		4						4	1.0
j1	⊓				1			1	2	.5
Gamaka Total		16	74		42	37		99	268	65.5
E	•		5		3	1		4	13	3.2
F	—				1			2	3	.7
Accent Total			5		4	1		6	16	3.9
G	Y	19	15		18	16		4	72	17.6
H	ʎ	16	3		8	11		3	41	10.0
Stylistic Total		35	18		26	27		7	113	27.6
Double Ornaments			3		2			7	12	2.9
Grand Total		51	100		74	65		119	409	99.9*

Table 6.9

Distribution of Held Tones:
Rāga III, Performer 6

Tone	Frequency of Tones	Range						Total	%
		Low		Middle		High			
		Unornamented	Ornamented	Unornamented	Ornamented	Unornamented	Ornamented		
Sa	124			2	2	3		7	6
Ri	133				2		1	3	2
(Ga)									
Ma	97								
Pa	111			2				2	2
(Da)									
Ni	119								
Total	584			4	4	3	1	12	2

Summary

The performers 1, 5, and 6 in Rāga III Madhyamāvati ornament 66%, 73% and 70% of all tones respectively; the other tones are unornamented. Of the ornamented tones, Ni is ornamented most frequently. The tones Ri, Ma, and Sa are the next highest. The tone Pa is ornamented least often.

All three performers use Aal, Cal, and stylistics more than any other ornament type, but stylistics are used more than Cal gamaka. Aal is used mostly on tone Ni by performer 1; and performers 5 and 6 use this on tones Ri and Ni. Cal is distributed on all five tones but performer 1 uses it on Sa and Ni, performer 5 on Pa and performer 6 on Ma and Ni. All performers use more of stylistic-G than stylistic-H. Abl is used by all the performers on tone Ri only.

Performers 1 and 5 use more varieties of type-C gamaka on tone Ni; performer 6 uses more varieties of type-D gamaka on tone Ri. Performer 5 does not use any type-B gamaka in this performance.

It is apparent that tones Ni and Ri are ornamented and important to the rāga. All three performers present some varieties of gamakas not used by the other performers.

The tones Sa, Ri, and Pa are held most by all three performers except performer 6 who uses Ni as a held tone. All the performers start on tone middle Ri and all end on middle Sa.

CHAPTER VII

GAMAKA USE IN THREE RĀGAS

The purpose of this chapter is to assemble data to make comparisons among three performances of ālāpana on each of three rāgas--Shankarābharana, Pūrvikalyāni, and Madhyamāvati--in how the musicians used ornamentation. No new data are introduced, however, in contrast to the tables in Chapters IV, V, and VI, it is given here entirely in percentage and with unornamented tones excluded from the data base. The tables are designed to make it easy to see across the same tone for the three performances in each rāga. Each cell locates a gamaka type on a tone. Each cell entry is a percentage of a given tone that is ornamented in a musician's total performance. Thus, the entries make allowance for any differences in absolute frequencies (raw numbers) from one performer to another, so that performances of differing duration or number of tones can be compared.

Tables 7.1, 7.2 and 7.3 are best read downwards cell by cell, focusing on one tone at a time (e.g. on Sa) and comparing across the cell for the three musicians' use of ornaments on that tone. Where a cell is completely blank it shows that none of the three performers used that ornament on that tone in the performances of ālāpana on that rāga in this corpus. This may indicate that the given ornament is not appropriate for that tone of that rāga, or it may result from the small sample (a single performance by the performer) which may not include all the kinds of ornaments the performer might use on that tone in another performance of ālāpana on the same rāga on another occasion. Where a

cell contains numbers for each performer, it shows that all the performers used that ornament thus agreeing in recognizing it as appropriate for that tone of that rāga. Different size numbers show different proportions of use--i.e. a different emphasis on that ornament for revealing the characteristics of the rāga. Where a cell contains only one number, it shows that only one performer used it in the corpus selections for that rāga. This may indicate a feature of a personal style, or result from the small size of the sample.

It is desirable to begin by making comparisons tone by tone, and follow with comparisons across tones.

Rāga I: Shankarābharana

Table 7.1 facilitates comparison of the three performances of Rāga I, Shankarābharana, which have been separately described in Chapter IV. It shows the percentage of occurrences of each tone which receives a given type of ornament in each of the three performances. It can be seen that consistency among performers was occasionally approached, for example, Cal on Ga (showing 7%, 9%, and 9% for musicians 1, 2, and 3 respectively) and Chl on Ma (showing 2%, 3%, and 2%). More often the figures indicate considerable divergence among the musicians in the placement of ornaments on tones, for example, Aal on Ri (showing 56%, 16%, and 36% for the three musicians). For type-A gamakas, 12 of the 21 cells which are used have an entry for all three performers; for type-C gamakas, 9 of the 25 used cells have an entry for all three; for type-B and type-D gamakas there are no cells where there are entries for all three musicians. This may reflect the higher frequencies in

Table 7.1

Comparison of Percentages of Gamakas Given to Each Tone: Rāga I, Performers 1, 2, 3

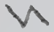
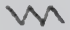
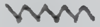
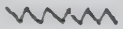
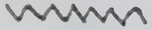
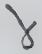
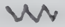
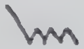
Gamaka Type		Sa			Ri			Ga			Ma			Pa			Da			Ni		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Aa1		21	3	11	56	16	36	7	2	9	3	3	13	7	14	39	26	22	42	70	22	70
a2					3	6	14				2	3	11				2	2	8			
a3																			1			
a4																		2	1			
a5																			1			
a6												1										
b1						8	15										15	9	6			
b2																		2				
c4							1															
f1		13	6	15							4		7	3								

Table 7.1 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga I, Performers 1, 2, 3

Gamaka		Sa			Ri			Ga			Ma			Pa			Da			Ni		
Type		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Ba1	\		3					2		3			2								2	
a2	∨								4	9	2	4										
a3	〰												4									
Ca1	/	11	9	21	8	8	20	7	9	9	21	11	29	24	12	25	7	11	8		2	11
a2	/∨										4	8										
a3	∧∨∨											3										
a4	∧∧∨∨											4										
f1	/∧				2		6				6	4	2				13		11	3	4	2
f2	/M						1				1		7						1			
f3	/MM						1															

Table 7.1 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga I, Performers 1, 2, 3

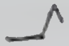
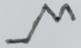
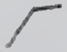
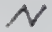
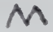
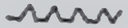
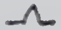
Gamaka Type		Sa			Ri			Ga			Ma			Pa			Da			Ni		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Cg1																		2				
g2																			1			
h1						2			2		2	3	2	4				2				
Da1								6		3	1			2			2		2			1
a2					2						1							4	1			
b1						10				9		3					4		4			
b2																			1			
e1																			1			
g1																		4				

Table 7.1 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga I, Performers 1, 2, 3

Gamaka Type		Sa			Ri			Ga			Ma			Pa			Da			Ni		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Gamaka Total		45	21	47	71	50	94	22	17	42	47	47	77	40	26	64	69	60	91	73	30	84
E	•		3		2	2		2	4	12	1			2			2	2	1		4	1
F	–	4	3	6		2						1	11		10	4	4					
Accent Total		4	6	6	2	4		2	4	12	1	1	11	2	10	4	6	2	1		4	1
G	Y	35	44	15	18	26	1	38	69	24	20	42	7	21	39	25	4	28	3	21	56	12
H	⅄	16	25	28	6	6	3	37	9	21	28	7	4	28	18	4	11	7		3	4	2

Table 7.1 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga I, Performers 1, 2, 3

Gamaka	Sa			Ri			Ga			Ma			Pa			Da			Ni		
Type	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Stylistic Total	51	69	43	24	32	4	75	78	45	48	49	11	49	57	29	15	35	3	24	60	14
Double Ornaments		3	4	2	14		2			5	4		9	6	4	9	2	4	3	6	
Grand Total	100	99*	100	99*	100	98*	101*	99*	99*	101*	101*	99*	100	99*	101*	99*	99*	99*	100	100	99*
Base for Percents	(56)	(32)	(47)	(121)	(50)	(66)	(121)	(45)	(33)	(126)	(74)	(45)	(57)	(49)	(28)	(46)	(46)	(87)	(66)	(50)	(89)

type-A and type-C, but also may imply greater agreement on placement of ornaments in them, particularly in the specific gamakas Aa1 and Ca1. Likewise all but one of the cells for type-G and type-H stylistics are used by all three musicians, often however, with great differences in amount (e.g. stylistic-G on Ni showing 21%, 56%, and 12%). However, if one considers all the possibilities which logically exist for the 33 kinds of ornaments used in the three performances on rāga I (i.e. 33 kinds x 7 tones = 231 possibilities) or for the 60 kinds of ornaments used in the corpus of this study (i.e. 420) or for possible others beyond that, perhaps the fact that the use by these three musicians concentrates mainly in less than 60 possibilities is a sign of some agreement.

There is some uniformity in the use of gamaka Aa2 which all three performers use on tones Ri, Ma, and Da (performers 1 and 2 are closer in their use of it than performer 3 is to either of them). This agreement fits with the importance traditionally ascribed to these tones in this rāga, however the tone Ni which is also considered important receives no gamaka Aa2. The total of all gamaka types on Ri, Ma, Da, and Ni does support the traditionally ascribed importance of these tones, so the absence of any contribution to the total ornamentation of tone Ni from gamaka Aa2 suggests that there may be a level of particularity in type of ornament on each tone that is learned through the traditional process of listening that is not (or seldom) verbalized. This could be a focus for a very detailed future study with a larger corpus of performances in this rāga.

Gamaka Ab1 is used by all three performers on tone Da, performer 1 far more than performers 2 or 3. Performers 2 and 3 use gamaka Ab1 on Ri, performer 3 far more than performer 2. Gamaka Af1 is used by all three performers on Sa, performers 1 and 3 being much closer in the use of this gamaka than performer 2 is with either of them. The other kinds of type-A gamakas are of individual style of use.

Rāga II: Pūrvikalyāni

Comparative table 7.2 of Rāga II, Pūrvikalyāni, shows that the three performers agree in using gamaka Aa1 on all tones except Sa. Only performer 2 uses this gamaka on Sa. The only other type-A gamaka used by all three performers on a single tone is Aa2 on tone Da.

The three performers agree in using gamaka Ca1 on all tones except Ni. They also agree in using Ca2 on tone Ri; Cf1 on tones Ga, Ma, and Da; and Db1 on tone Ga. Performers 1 and 2 agree in using Ca1 on tone Ni, and Db1 on tone Da. Performers 4 and 2 agree in using Ch1 on tones Ri and Ga.

The tones Ri, Ga, Ma, Da, and Ni have a higher proportion of gamakas than do the drone tones of Sa and Pa with a single exception of an individually low use of tone Ni by performer 4.

On no tone do all three performers agree in their use of accents; but two performers (not the same two in each case) use accent-E on tones Ri, Ga, Da, and Ni, and accent-F on tones Sa, Ri, and Pa. Stylistic-G is used by all three performers on all tones. Stylistic-H is used on five tones only (Sa, Ri, Ga, Ma, and Pa); performers 1 and 2 use this stylistic on tone Da, and only performer 2 on Ni. The three performers

Table 7.2

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga II, Performers 1, 4, 2

Gamaka		Sa			Ri			Ga			Ma			Pa			Da			Ni		
Type		1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2
Aa1	╲			7	16	26	43	40	39	46	57	49	54	7	6	15	48	33	57	57	34	86
a2	╲╱╲						6	11			3						13	2	4			
a3	╲╱╲╱╲																		2			
c1	╲╱				16																	
c2	╲╱╲												2									
f1	╲_	14			2									21		8						
Ba1	╲														18							
a2	∨				6																	
Ca1	╱	29	36	30	15	9	14	16	7	23	3	4	18	21	18	23	11	6	18	19		3
a2	╱╲╱				5	19	4															
a4	╱╲╱╲╱					5																

Table 7.2 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga II, Performers 1, 4, 2

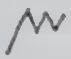
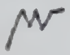
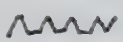
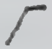
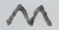
Gamaka		Sa			Ri			Ga			Ma			Pa			Da			Ni		
Type		1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2
Cc1					3																	
d1						2																
e1					2																	
f1						2		9	9	2	3	11	4				2	6	2			
h1						7	6		2	2								6				
Da1											9											3
b1							2	2	9	9			2				11		6			3
b2										2												
Gamaka Total		43	36	37	65	70	75	78	66	84	75	64	80	49	42	46	85	53	89	76	34	95

Table 7.2 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga II, Performers 1, 4, 2

Gamaka Type		Sa			Ri			Ga			Ma			Pa			Da			Ni		
		1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2
E	•				8	5		2		5			4					6	2	10	2	
F	—		21	11	3		4			2			2	7	5		2					
Accent Total			21	11	11	5	4	2		7			6	7	5		2	6	2	10	2	
G	⋎	29	21	37	2	19	16	11	30	5	21	34	6	21	29	38	7	37	4	14	64	3
H	⋏	29	21	11	20	5	6	7	5	3	3	2	6	14	24	8	2		2			3
Stylistic Total		58	42	48	22	24	22	18	35	8	24	36	12	35	53	46	9	37	6	14	64	6

Table 7.2 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Raga II, Performers 1, 4, 2

Gamaka	Sa			Ri			Ga			Ma			Pa			Da			Ni		
Type	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2
Double Ornaments			4	2	2		2		2			2	7		8	4	4	4			
Grand Total	101*	99*	100	100	101*	101*	100	101*	101*	99*	100	100	98*	100	100	100	100	101*	100	100	101*
Base for Percents	(14)	(14)	(27)	(61)	(43)	(51)	(45)	(44)	(65)	(33)	(47)	(55)	(14)	(17)	(13)	(46)	(49)	(54)	(21)	(47)	(37)

agree in using double ornament on tone Da, and two performers on tones Ri, Ga, and Pa.

Rāga III: Madhyamāvati

Comparative table 7.3 of Rāga III, Madhyamāvati, shows that all three performers agree in using gamaka Aa1 on all five tones of the rāga (Sa, Ri, Ma, Pa, and Ni). They also agree in using Ca1 on all five tones; Cf1 and Ch1 and tone Ni. Performers 1 and 5 agree in using Aa2 on tone Ri, Ca2 on tone Ni, and Cf2 on tone Ni. Performers 1 and 6 agree in using Ab1 and Db1 on tone Ri, and Ba2 on tone Sa. Performers 5 and 6 agree in using Cf1 and Db1 on tone Ma, and Df3 on tone Ri. There is no agreement in the use of type-D by the three performers, but performer 6 uses the highest percentage which reveals his style in this rāga performance. Accent-E is used by all three performers on tone Ri, and accent-F on tone Ma. Stylistic-G is used by all three performers on all five tones. There is also agreement by all performers in using double ornaments on tone Ni, and by performers 5 and 6 on tones Ri and Ma.

Summary

Of the total 60 kinds of ornaments in the corpus (55 gamakas, 2 accents, and 3 stylistics), performers 1, 2, and 3 use respectively 17, 20, and 26 kinds of ornaments in their ālāpanas on Rāga I, Shankarābharana. Their collective total is 33 (29 gamakas, 2 accents, and 2 stylistics). All three performers use ornaments to give more emphasis to certain tones than to other tones of the rāga. For example, in descending order of percentage of ornamentation, performer 1 concentrates on

Table 7.3

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga III, Performers 1, 5, 6

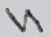
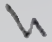
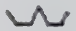
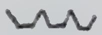
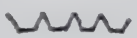
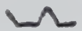
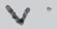
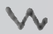
Gamaka Type		Sa			Ri			(Ga)			Ma			Pa			(Da)			Ni		
		1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6
Aa1		19	10	12	26	40	38				59	41	16	20	28	42				50	39	41
a2					2	17																2
b1					17		6															
c2																						1
d1					2																	
d2						1																
d3						2																
e1							2															
Ba2		3		4																3		
b1																				2		

Table 7.3 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga III, Performers 1, 5, 6

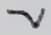
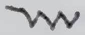
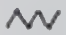
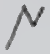
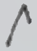
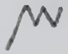
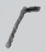
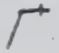
Gamaka Type		Sa			Ri			(Ga)			Ma			Pa			(Da)			Ni		
		1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6
Bc1																						1
c2																						1
Ca1		28	12	16	10	8	8				18	10	19	24	20	15				11	6	9
a2																				2	1	
a3																					1	
b1																				2		
f1					2							6	14							8	13	10
f2																				2	1	
h1												1								7	1	10
h2																					1	

Table 7.3 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga III, Performers 1, 5, 6

Gamaka Type		Sa			Ri			(Ga)			Ma			Pa			(Da)			Ni		
		1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6
Da1	/		1				1							4	1						1	
a2	/\/						2													2		
b1	∧				12		2					6	7								6	7
b2	∧∧																					1
c1	∧∧∧						1															
d1	_∧∧						1															
f1	_∧					9																
f2	_∧∧				5																	
f3	_∧∧∧					1	1															
f4	_∧∧∧∧						1															
g1	∧_						4															

Table 7.3 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga III, Performers 1, 5, 6

Gamaka Type		Sa			Ri			(Ga)			Ma			Pa			(Da)			Ni		
		1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6
Dh1							1															
h2							1															
h3							1															
i1							4															
j1	⊓												1									1
Gamaka Total		50	23	22	76	78	67				77	64	57	48	49	57				89	70	84
E	•				12	7	5				5		4		1	1					2	3
F	–					1					5	3	1								7	2

Table 7.3 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga III, Performers 1, 5, 6

Gamaka		Sa			Ri			(Ga)			Ma			Pa			(Da)			Ni		
Type		1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6
Accent Total					12	8	5				10	3	5		1	1					9	5
G	≺	38	51	37	7	7	15					19	24	48	34	25				8	5	3
H	ʎ	12	26	31	5	3	3				14	3	11	4	15	17				2	1	3
Stylistic Total		50	77	68	12	10	18				14	22	35	52	49	42				10	6	6
Double Ornaments						4	3					10	3							2	14	6

Table 7.3 (Continued)

Comparison of Percentages of Gamakas Given to Each Tone:
Rāga III, Performers 1, 5, 6

Gamaka	Sa			Ri			(Ga)			Ma			Pa			(Da)			Ni		
Type	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6
Grand Total	100	100	100	100	100	100				101*	99*	100	100	99*	100				101*	99*	101*
Base for Percents	(32)	(69)	(51)	(42)	(92)	(100)				(22)	(68)	(74)	(25)	(61)	(65)				(60)	(95)	(119)

tones Ni, Ri, and Da; performer 2 on tones Da, Ri, and Ma, and performer 3 on tones Ri, Da, Ni, Ma, and Pa. These performers agree on emphasizing ornamentation on certain tones (Ri, Da) but each shows individual interpretation of the rāga in giving emphasis to certain other tones. In these performances, the three performers agree in giving certain gamakas to certain tones. Aa1 is found on all tones; Aa2 on tones Ri, Ma, and Da; Ab1 on tone Da; Af1 on tone Sa; Ca1 on all tones except Ni; Cf1 on tones Ma and Ni; and Ch1 on Ma. Accent-E is found on tones Ga and Da; accent-F on tone Sa; stylistic-G on all seven tones; stylistic-H on all tones except Da, and double ornament on tones Pa and Da.

Some gamakas are used by only one performer which expresses that performer's idiosyncrasy in the particular performance analyzed. For example, performer 2 uses Aa6 on tone Ma; and Ab2 and Dg1 on tone Da; performer 3 uses Aa5, Cg2, Db2, and De1 on tone Da; Ac4 and Cf3 on tone Ri; and Ba3 on tone Ma. In this performance, performer 1 does not use any kind of ornament not also used by one or both of the other performers.

There is agreement in placing certain kinds of gamakas on certain tones. Each performer emphasizes certain tones in giving gamaka and may express his or her individual style through choice of a few less frequently used gamakas.

In rāga II, Pūrvikalyāni, in these performances, performers 1, 4 and 2 use respectively 15, 14, and 15 kinds of ornaments and collectively a total of 23 (18 gamakas, 2 accents, and 3 stylistics) of the 60 in the whole corpus. In descending order of percentage of ornamentation, performer 1 uses more kinds of gamaka on tones Da, Ga, Ni, Ma, and Ri;

performer 4 on tones Ri, Ga, Ma, and Da; and performer 2 on tones Ni, Da, Ga, Ma, and Ri.

In these performances, the three performers agree in giving certain gamakas to certain tones. Aa1 is given to all tones; Aa2 to tone Da only; Ca1 to all tones except Ni; Ca2 to tone Ri; Cf1 to tones Ga, Ma, and Da; and Db1 to tone Ga.

Each of the three performers gives unusual gamakas to certain tones in these performances which present their individual styles. Only performer 1 uses Ac1, Ba2, Cc1, and Ce1 on tone Ri, and Da1 on tone Ma; performer 4 uses Ca4, Cd1 on tone Ri, and Ba1 on tone Pa. Performer 2 uses Aa3 on tone Da, Ac2 on tone Ma, and Db2 on tone Ga. Accents are used on tones Ri and Ni by performer 1. Performers 4 and 2 use more accents on Sa than on other tones. Performer 1 uses more stylistics on tone Sa, performer 4 on tone Ni, performer 2 on tones Sa and Pa.

In Rāga III, Madhyamāvati, in these performances, performers 1, 5, and 6 use respectively 17, 22, and 27 kinds of ornaments and collectively a total of 40 (36 gamakas, 2 accents, and 2 stylistics). In this five-tone rāga, in descending order of percentage of ornamentation, performer 1 concentrates on tones Ni, Ma, Ri, and Sa; performer 5 on tones Ri, Ni, and Ma, and performer 6 on tones Ni, Ri, Ma, and Pa.

All three performers agree in giving certain gamakas to certain tones. Aa1 and Ca1 to all 5 tones, Cf1 and Ch1 to tone Ni, accent-E to tone Ri, accent-F to tone Ma. Stylistic-G is given to tones Sa, Ri, Pa, and Ni; and stylistic-H to all 5 tones. The three performers agree in giving double ornaments to tone Ni.

Evidence of individual style in the giving of certain kinds of gamakas to certain tones is found in these performances. Performer 1 gives Ad1 and Df2 to tone Ri, performer 5 gives Ad2, Ad3, Df1, and accent-F to tone Ri, and Ca3 and Ch2 to tone Ni. Performer 6 gives Dc1, Dd1, Df4, Dg1, Dh1, Dh2, Dh3, and Di1 to tone Ri; Ac2, Bc1, Bc2, Db2 to tone Ni, and Dj1 to tones Ma and Ni.

Performer 1 uses accents on Sa and Ma but performers 5 and 6 do not use any accents. All three performers use different proportions of stylistic on tone Sa only.

It is apparent that there is some agreement in giving specific gamakas to specific tones in these three rāgas. But each performer also gives special emphasis to certain tones that others do not and exercises some individual choice of gamakas which may be specific to the performance or be characteristic of his or her style. Because all of the performances selected for the corpus are by esteemed performers, the data indicates that balanced with the demands of rāga-specific use of ornaments is freedom to exercise an individual style.

CHAPTER VIII

GAMAKAS BY ONE PERFORMER

In this chapter, data are assembled to make comparisons among performances by a single musician, M. S. Subbulakshmi, an ālāpana on each of three rāgas--Shankarābharana, Pūrvikalyāni, and Madhyamāvati--to see how one musician uses ornamentation in three different contexts (i.e. rāgas).

No new data are introduced, however the presentation is different from that of the tables in Chapters IV, V, and VI. The data can be examined for statistically significant differences in treatment of different tones, and the results compared with the traditional concepts of treatment of these tones. In doing so, it should be remembered that even in performances by a single musician, there would be some differences in a performance on another occasion--for that is characteristic of improvisation.

In singing ālāpana, a performer improvises on a rāga. Selection of tones of the rāga is inherent in the process of improvisation. The tones have specific relationships to the rāga, and have some specific gamakas intrinsically associated with them. The tones may also be given some other ornaments. Certain tones are sung with gamaka in some melodic contexts and without gamaka in other contexts.

In improvising an ālāpana, a performer chooses melodic segments of several tones of the rāga to develop and elaborate to reveal the essence of the rāga. Within the requirements of the rāga and the norms of the traditions, the performer has freedom to choose the tones to create

these melodic segments. Also within the specific requirements of the rāga and the norms of the tradition, the performer chooses how to use the specifically associated gamakas and the other ornamentation.

Because ālāpana is improvised, and not bound by either text or tāla, it provides an effective vehicle for the expression not only of a rāga but also of a performer's individual concept of it and a performer's style.

One of the most significant aspects of the comparisons in this chapter lies in the fact that the ālāpana on each of the three rāgas of this corpus are performed by the same highly regarded singer, M. S. Subbulakshmi. This limits the variables to that performer's individual style so that differences in treatments of gamakas and other ornaments in the three rāgas may be seen as significant to the same performer's concept of three different rāgas.

In Table 8.1, it can be seen that in the ālāpana in Rāga I, Shankarābharana, Subbulakshmi ornaments the tones Da, Ri, and Ni most frequently; tone Pa, and Sa only about a third as often as the first three; and tone Ga the least of all.

In the ālāpana in Rāga II, Pūrvikalyāni, Subbulakshmi ornaments the tones Da, and Ma, and the most frequently, followed by tones Ni, Ga, and Ri; tone Pa less than a third as often as Ni; and Sa less than half of Pa.

In the ālāpana in Rāga III, Madhyamāvati, Subbulakshmi ornaments the tone Ni far more frequently than the other tones; Ri and Ma next, and Sa and Pa less than a third of Ni.

Table 8.1

Comparison of Percentage Distribution of Tones and Gamakas: Rāgas I, II, III; Performer 1

Rāga	Tone	Tones w/ Gamaka	Tones w/ Accent	Tones w/ Stylistic	Tones w/ Double Ornaments	Total Tones w/ Ornaments	Total Tones w/o Ornaments	All Tones	Base for Percent
I	Sa	20	2	24		46	54	100%	(122)
	Ri	67	2	22	1	92	8	100%	(131)
	Ga	16	1	56	1	74	26	100%	(164)
	Ma	39	1	41	3	84	16	100%	(150)
	Pa	22	1	26	5	54	46	100%	(105)
	Da	70	6	15	9	100		100%	(46)
	Ni	64		21	3	88	12	100%	(75)
	Total								(793)
II	Sa	10		13		23	77	100%	(60)
	Ri	56	10	18	2	86	14	100%	(71)
	Ga	57	2	13	2	74	26	100%	(61)
	Ma	73		24		97	3	100%	(34)
	Pa	22	3	16	3	44	56	100%	(32)
	Da	75	2	8	4	89	11	100%	(52)
	Ni	64	8	12		84	16	100%	(25)
	Total								(335)
III	Sa	25		25		50	50	100%	(64)
	Ri	56	9	9		74	26	100%	(57)
	(Ga)								
	Ma	51	6	9		66	33	100%	(33)
	Pa	22		24		46	54	100%	(54)
	(Da)								
	Ni	82		7	3	92	8	100%	(65)
	Total								(273)

Comparing these data to traditional concepts, it is expected that these tones are important to the rāga.

M. S. Subbulakshmi uses a total of 25 kinds of ornaments including accents and stylistics of which 21 types of gamakas are sung on different tones. Three gamaka types are sung in all three rāgas (on different tones); two gamaka types are sung in two rāgas (on different tones); and the rest of the 16 types are sung in only one of the three rāgas.

Two gamakas are oscillations(Aa2 and Ca2). Gamaka Aa2 is sung by the performer in all the three rāgas on different tones. The oscillations are consistent in each of the three rāgas. Being consistent in use of gamaka in performance is highly regarded in the tradition and is part of a respected musician's style. For example, as can be seen in Table 8.2, Subbulakshmi uses gamaka Aa2 on tones Ri, Ma, and Da in Rāga I; tones Ga, Ma, and Da in Rāga II; and tone Ri in Rāga III. Gamaka Ca2 is an oscillation gamaka which is sung in Rāgas I and II on different tones.

Subbulakshmi's individual style is revealed in her use of gamakas on different tones in two different rāgas. For example, gamaka Ab1 is used in Rāga I on tone Ri and in Rāga III on tone Da with a relatively high percentage in both (17% and 15% respectively). Gamaka Db1 is used in three rāgas on different tones. For example, in Rāga I on tone Da, in Rāga II on tone Da; and in Rāga III on tone Ri.

The drone tones Sa and Pa are given Af1 type gamaka, and are used in Rāgas I and II only. The percentages are quite high for each (11% and 12% respectively).

Table 8.2

Comparison of Percentage Distribution of Tones and Gamaka Types:
Rāgas I, II, III; Performer 1

Gamaka		Sa			Ri			Ga		Ma			Pa			Da		Ni		
Type		I	II	III	I	II	III	I	II(III)	I	II	III	I	II	III	I	II(III)	I	II	III
Aa1	\	21		19	56	16	26	7	40	3	57	59	7	7	20	26	48	70	57	50
a2	\/\				3		2		11	2	3					2	13			
b1	γ						17									15				
c1	\/					16														
d1	_/_/						2													
f1	_	13	14			2				4			3	21						
Ba1	\							2												
a2	∨			3		6				2										3
b1	\/\/																			2
Ca1	/	11	29	28	8	15	10	7	16	21	3	18	24	21	24	7	11		19	11
a2	/\/					5				4										2

Table 8.2 (Continued)

Comparison of Percentage Distribution of Tones and Gamaka Types:
Rāgas I, II, III; Performer 1

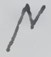
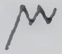
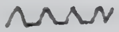
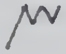
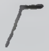
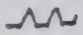
Gamaka Type		Sa			Ri			Ga		Ma			Pa			Da		Ni		
		I	II	III	I	II	III	I	II(III)	I	II	III	I	II	III	I	II(III)	I	II	III
Cb1																				2
c1						3														
e1						2														
f1					2		2		9	6	3					13	2	3		8
f2										1										2
h1										2			4							7
Da1								6		1	9		2		4	2				
a2					2					1										2
b1							12		2							4	11			
f2							5													

Table 8.2 (Continued)

Comparison of Percentage Distribution of Tones and Gamaka Types:
Rāgas I, II, III; Performer 1

Gamaka Type		Sa			Ri			Ga		Ma			Pa			Da		Ni		
		I	II	III	I	II	III	I	II(III)	I	II	III	I	II	III	I	II(III)	I	II	III
Gamaka Total		45	43	50	71	65	76	22	78	47	75	77	40	49	48	69	85	73	76	89
E	•				2	8	12	2	2	1		5	2			2			10	
F	–	4				3						5		7		4	2			
Accent Total		4			2	11	12	2	2	1		10	2	7		6	2		10	
G	Y	35	29	38	18	2	7	38	11	20	21	14	21	21	48	4	7	21	14	8
H	λ	16	29	12	6	20	5	37	7	28	3		28	14	4	11	2	3		2

Table 8.2 (Continued)

Comparison of Percentage Distribution of Tones and Gamaka Types:
Rāgas I, II, III; Performer 1

Gamaka Type	Sa			Ri			Ga		Ma			Pa			Da		Ni		
	I	II	III	I	II	III	I	II(III)	I	II	III	I	II	III	I	II(III)	I	II	III
Stylistic Total	51	58	50	24	22	12	75	18	48	24	14	49	35	52	15	9	24	14	10
Double Ornaments				2	2		2	2	5			9	7		9	4	3		2
Grand Total	100	100	100	99*	100	100	101*	100	101*	99*	101*	100	100	100	99*	100	100	100	101*
Base for Percents	(56)	(14)	(32)	(121)	(61)	(42)	(121)	(45)	(126)	(33)	(22)	(57)	(14)	(25)	(46)	(46)	(66)	(21)	(60)

Gamaka Aal and Cal are sung in larger proportions in all the three rāgas. Accents are not sung on all tones of the three rāgas. Accent-E is given in all the three rāgas by Subbulakshmi on tone Ri but Rāgas II and III get the highest percentages. Stylistics are also used in all the three rāgas and more often than the other gamakas.

As may be seen in Table 8.3, held tones are used on tones Sa, Ga, Pa, and Ma in Rāga I; on tones Sa, Ga, and Pa in Rāga II; and on tones Sa, Ri, and Pa in Rāga III.

As it is expected in the tradition, M. S. Subbulakshmi starts and ends on tone Sa in Rāgas I and II. In Rāga III, she starts the performance on tone Ri and ends on Sa.

M. S. Subbulakshmi is a fine performer and is very well known for her voice quality and technique. In the transcription, one can see the long held tones which are a distinctive part of her style. She is very consistent in giving oscillation type gamakas to rāgas. She also sings with a variety of other gamakas in the rāgas.

Table 8.3

Comparison of Distribution of Held Tones:
Rāgas I, II, III; Performer 1

Rāga	Tones	Frequency of Tones	Register			Total	%
			Low	Middle	High		
I	Sa	122		6	5	11	9
	Ri	131					
	Ga	164			9	10	6
	Ma	150				1	1
	Pa	105		7		6	6
	Da	46					
	Ni	75					
	Total	793		13	14	28	4
II	Sa	60		5	5	10	17
	Ri	71					
	Ga	61		4	1	5	8
	Ma	34					
	Pa	32		3		3	9
	Da	52					
	Ni	25					
	Total	335		12	6	18	5
III	Sa	64		4	5	9	14
	Ri	57		1	2	3	5
	(Ga)						
	Ma	33					
	Pa	54	1	5		6	11
	(Da)						
	Ni	65					
	Total	273	1	10	7	18	7

CHAPTER IX

FURTHER COMPARISONS OF GAMAKA

We have seen in preceding chapters that the gamaka is an important device of ornamenting or shaking tones. However, there is great variation in the frequency with which tones are ornamented and in exactly how they are ornamented.

This study does not have an ideal statistical sample; it is only three rāgas, with three performances of each. However, each rāga is a good example of the tradition, each is important and often performed, and none is unusual compared with other rāgas. Also, each performance conforms to high artistic standards--the artists are recognized, established masters. Still, since we do not have a statistically representative sample of the great body of Karnatic music, it will be assumed that additional performances would show additional varieties of gamakas.

We may ask two related questions of Table 9.1. Do performers agree on how much (or how often) to ornament tones? Do performers agree on which tones get ornamented more than other tones?

We can answer the first question by comparing the size of the percentages. For this, we compare across rows for the three performers on each rāga.

We can answer the second question by comparing the rank order of the percentages. For this we compare down columns for each rāga, noting the highest percent as rank 1, the next highest as rank 2, and so on, and then comparing rank orders from one performer to another.

There is substantial agreement on the first question in all three rāgas on tones with gamaka. There are more differences in stylistics.

There is high agreement on the second question among performers on Rāga III; on Rāga I, high agreement between performers 1 and 2, moderate agreement between 3 and 2, and high agreement between 1 and 3. For Rāga II, there is agreement about low ranking tones, but not much agreement on high rankings.

Overall, there seems to be high agreement on gamaka among the performers; individual differences however are also apparent.

In Table 9.1, it can be seen that in Rāga I, Shankarābharana, three performers concentrate gamaka predominantly on certain tones. For example, performer 1 on tone Da, 100% of which are ornamented (gamaka 70%, accent 6%, stylistics 15% and double ornaments 9%), and performer 2 on tone Ri, 96% of which are ornamented (gamaka 48%, accent 4%, stylistics 31% and double ornaments 13%); performer 3 on tone Da, 81% of which are ornamented (gamaka 74%, accent 1%, stylistics 3% and double ornaments 4%).

It can be seen that in Rāga I, Shankarābharana, tones Ri, Ma, Da, and Ni are important tones which receive a high percentage of gamakas. But here only the highest percentage of gamaka on a tone is discussed to illustrate differences in performers' choices in giving gamaka to a tone as well as exhibiting style. Performers 1 and 3 give more emphasis to tone Da, performer 2 to tone Ri. Even with the agreement between performers 1 and 3 in emphasizing tone Da, they differ from one another in their giving of stylistics and accents which illustrates that there is

Table 9.1

Comparison of Percentage Distribution of Tones and Gamakas: All Rāgas; All Performers

Rāgas	Tone	Tones w/ Gamaka			Tones w/ Accent			Tones w/ Stylistic			Tones w/ Double Ornaments			Total Tones w/ Ornaments			Total Tones w/o Ornaments			All Tones	Base for Percents		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		1	2	3
I	Sa	20	10	16	2	3	2	24	31	14		1	2	46	45	34	54	55	66	100%	(122)	(71)	(141)
	Ri	67	48	60	2	4		22	31	3	1	13		92	96	63	8	4	37	100%	(131)	(52)	(105)
	Ga	16	10	11	1	2	3	56	43	12	1			74	55	26	26	45	74	100%	(164)	(92)	(126)
	Ma	39	36	27	1	1	4	41	38	4	3	3		84	78	35	16	22	65	100%	(150)	(95)	(130)
	Pa	22	14	15	1	6	1	25	35	7	5	4	1	54	60	23	46	40	77	100%	(105)	(82)	(123)
	Da	70	46	74	6	2	1	15	26	3	9	2	4	100	76	81		24	19	100%	(46)	(51)	(112)
	Ni	64	23	51		4	1	21	55	9	3	5		88	91	61	12	9	39	100%	(75)	(55)	(146)
	Total																				(793)	(498)	(883)
		1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2		1	4	2
II	Sa	10	7	13		4	4	13	9	17			1	23	20	35	77	80	65	100%	(60)	(71)	(76)
	Ri	55	41	43	10	3	3	18	14	14	2	1		86	59	65	14	41	35	100%	(71)	(73)	(79)
	Ga	57	52	50	2		4	13	27	6	2		2	74	79	72	26	21	28	100%	(51)	(56)	(50)
	Ma	73	63	70			5	24	35	9			2	97	98	86	3	2	14	100%	(34)	(48)	(64)
	Pa	22	15	19	3	2		16	24	13	3		3	44	45	42	56	55	58	100%	(32)	(38)	(31)
	Da	75	46	75	2	5	1	8	32	5	4	4	3	89	86	84	11	14	16	100%	(52)	(57)	(54)
	Ni	64	31	88	8	2		12	58	5				84	91	93	16	9	17	100%	(25)	(52)	(40)
	Total																				(335)	(395)	(444)
		1	5	6	1	5	6	1	5	6	1	5	6	1	5	6	1	5	6		1	5	6
III	Sa	25	17	13				25	55	28				50	72	41	50	28	59	100%	(64)	(96)	(124)
	Ri	56	62	55	9	6	4	9	8	14		3	3	74	79	73	26	21	27	100%	(57)	(116)	(133)
	(Ga)																						
	Ma	51	47	43	6	2	4	9	16	27		7	2	66	72	76	33	28	24	100%	(33)	(94)	(97)
	Pa	22	23	33		1	1	24	23	24				46	48	58	54	52	42	100%	(54)	(127)	(111)
	(Da)																						
	Ni	82	68	83		9	5	7	6	6	3	13	6	92	97	100	8	3		100%	(65)	(98)	(119)
	Total																				(273)	(531)	(584)

a uniformity in giving ornaments to the important tones of the rāga but at the same time individual treatment within the rules.

In Rāga II, Pūrvikalyāni, performer 1 gives an emphasis to tone Ma; performers 4 and 2 agree in giving emphasis to tone Ni. But performer 4 gives only 31% gamaka, 2% accent, and 58% stylistics and there are no double ornaments. In contrast to this, performer 2 gives 88% of gamaka, no accent, and only 5% on stylistics. The tones Ni, Ga, Ma, Ri and Da are important tones of this rāga.

In Rāga III, Madhyamāvati, performers 1 and 6 agree in giving their highest percentage of gamaka to tone Ni (92%, 97%), and performer 5 to tone Ri (79%). But performer 1 gives 82% gamaka, no accents, 7% stylistics, and 3% double ornaments. Performer 6 is close to performer 1 except that he gives 9% accents. It is traditionally believed that the tones Ri, Ma, and Ni are important to Rāga III. Performers agree in the rāga's characteristics but have freedom in choosing the tones and in revealing their own style.

It is logical to question whether there may be more similarity in the gamaka treatment of tones in which the same scale variant (e.g. Ma_2) is used in two rāgas than when different variants (e.g. Ma_1 and Ma_2) are used. Surveying the distribution of gamakas to tone while keeping the scale variants in mind showed no significant tendency to treat a particular scale degree variant alike. The evidence suggests that each tone in each rāga has some type of ornamentation distinctive to itself in addition to receiving some ornaments shared by other rāgas and other tones. This agrees with the traditional belief and practice that a rāga can be identified by the characteristic gamaka on one of its tones and

that it is the kind of gamaka on certain tones that differentiates two or more rāgas with the same scale degrees from one another.

In Table 9.2, all performances are assembled in one table showing gamaka type. In this table, unlike other tables for each rāga, all gamaka types are listed. It can be seen how widely used each is. From this table it is evident that a number of distinct types of gamaka are used rarely within this set of nine performances. In this table, the entries are percentages of each performance total of ornamented tones; it can be seen that there are 59 instances (cells in the table) where a particular gamaka type accounts for less than one percent of all ornamented tones. For many types, such infrequent usage is the only use recorded. The following are used only once in the nine performances, and account for less than 1% of the ornamented tones used in the performances:

Aa3, a4, a5, a6, b2, c2, c3, c4, d1, d2
Ba3, b1, c1, c2
Cb1, c1, d1, e1, f3, g1, g2, h2
Dc1, d1, f4, h1, h2, h3, j1

The gamakas Aa1, a2, Ca1, f1, Da1, and the stylistics account for a sizable percentage of the totals of ornamented tones in each of the nine performances. Accents and double ornaments are always used in small amounts.

Table 9.2 permits detailed comparisons of gamaka type. Again, while individual performer variations exist, agreement is apparent on those types most frequently used. These are:

Table 9.2

Comparison of Percentage Distribution of Gamaka Types:
All Rāgas; All Performers

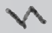
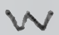
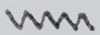
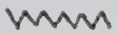
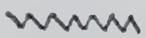
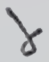
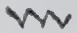
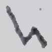
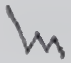
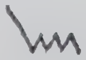
Gamaka Type		Rāga I			Rāga II			Rāga III		
		1	2	3	1	4	2	1	5	6
Aa1		26.0	11.6	37.4	35.0	32.1	49.3	35.9	32.7	32.3
a2		1.2	1.7	5.3	5.1	.4	1.6	.5		.5
a3				.3			.3			
a4			.3							
a5				.3						
a6			.3							
b1		1.2	2.3	3.8				3.9	4.2	1.5
b2			.3							
c1					4.2					
c2							.3			
c3										.2
c4				.3						

Table 9.2 (Continued)

Comparison of Percentage Distribution of Gamaka Types:
All Rāgas; All Performers

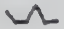
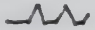
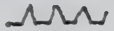
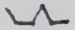
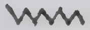
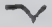
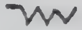
Gamaka		Rāga I			Rāga II			Rāga III		
Type		1	2	3	1	4	2	1	5	6
Ad1								.5		
d2									.3	
d3									.5	
e1										.5
f1		2.4	.6	2.5	2.6		.3			
Ba1		.3	.6	.5		1.1	.3			
a2		.5	1.4	.8	1.7			1.7		.5
a3				.5						
b1								.5		
c1										.2
c2										.2

Table 9.2 (Continued)

Comparison of Percentage Distribution of Gamaka Types:
All Rāgas; All Performers

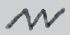
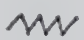
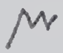
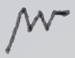
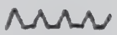
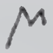
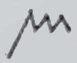
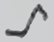
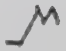
Gamaka		Rāga I			Rāga II			Rāga III		
Type		1	2	3	1	4	2	1	5	6
Cal		11.6	9.0	15.9	14.1	7.6	17.9	16.6	10.4	12.5
a2		.8	1.7		1.2	3.1	.7	.5	.3	
a3			.6						.3	
a4			.9			.8				
bl								.5		
cl					.9					
dl						.4				
el					.4					
fl		3.0	1.4	4.3	2.6	5.0	1.3	3.3	4.2	5.3
f2		.2		1.3				.5	.3	
f3				.3						
gl			.3							
g2				.3						

Table 9.2 (Continued)

Comparison of Percentage Distribution of Gamaka Types:
All Rāgas; All Performers

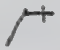
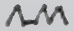
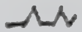
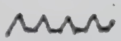
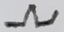
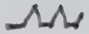
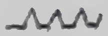
Gamaka		Rāga I			Rāga II			Rāga III		
Type		1	2	3	1	4	2	1	5	6
Ch1		.8	1.4	.3		2.7	1.3	2.2	.5	2.9
h2									.3	
Da1		1.6		1.0	1.3		.3	.5	.8	.2
a2		.6	.6	.3						.5
b1		.3	2.0	1.8	2.6	1.5	4.0	3.3	2.6	3.7
b2				.3			.3			.2
c1										.2
d1										.2
e1				.3						
f1									2.1	
f2								1.1		
f3									.3	.2

Table 9.2 (Continued)

Comparison of Percentage Distribution of Gamaka Types:
All Rāgas; All Performers

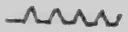
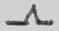
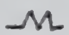
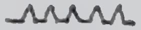
Gamaka Type		Rāga I			Rāga II			Rāga III		
		1	2	3	1	4	2	1	5	6
Df4										.2
g1										1.0
h1			.6							.2
h2										.2
h3										.2
i1										1.0
j1										.5
Gamaka Total		50.8	37.6	77.7	71.8	54.6	78.1	71.8	59.5	65.5
E	•	1.2	2.0	1.5	3.4	2.3	2.0	3.3	2.1	3.2

Table 9.2 (Continued)

Comparison of Percentage Distribution of Gamaka Types:
All Rāgas; All Performers

Gamaka Type		Rāga I			Rāga II			Rāga III		
		1	2	3	1	4	2	1	5	6
F	–	.6	2.3	2.3	1.7	1.5	2.3	.5	2.8	.7
Accent Total		1.9	4.3	3.8	5.1	3.8	4.3	3.9	4.9	3.9
G	Y	23.9	43.1	10.1	11.1	35.5	10.6	17.7	20.8	17.6
H	ʎ	20.1	9.8	6.8	9.8	5.0	4.3	6.1	8.6	10.0
I	Y						.3			
Stylistic Total		44.0	52.9	16.9	20.9	40.5	15.2	23.8	29.4	27.6

Table 9.2 (Continued)

Comparison of Percentage Distribution of Gamaka Types: All Rāgas; All Performers

Gamaka	Rāga I			Rāga II			Rāga III		
Type	1	2	3	1	4	2	1	5	6
Double Ornaments	3.3	5.2	1.8	2.1	1.1	2.3	.5	6.2	2.9
Grand Total	100.0	100.	100.2*	99.8*	100.0	99.9*	100.0	100.0	99.9*
Base for Percents	(593)	(346)	(395)	(234)	(262)	(302)	(181)	(385)	(409)

Aa2	three performers agree on Rāgas I and II
Ab1	three performers agree on Rāgas I and III
Af1	three performers agree on Rāga I
Ba1	three performers agree on Rāga I
Ba2	three performers agree on Rāga I
Ca2	three performers agree on Rāga II
Cf1	three performers agree on Rāgas I, II, and III
Ch1	three performers agree on Rāgas I and III
Da2	three performers agree on Rāga I
Db1	three performers agree on Rāgas I, II, and III

As can be seen in Table 9.3, the drone pitches, Sa and Pa, are held in all the three rāgas by all performers except one who used none on any tone. However, the percentages of use vary according to individual style. In Rāga I, tones Sa, Ga, and Pa are held by all performers; other tones vary according to the performer. In Rāga II, both performers that hold tones do so on Sa, Ga, and Pa only. In Rāga III, tones Sa, Ri, and Pa are held by all performers; there is only one instance of another tone.

Table 9.3

Comparison of Distribution of Held Tones: All Rāgas; All Performers

Rāga/ Performer	Tones	Frequency of Tones	Register			Total	%	Rāga/ Performer	Tones	Frequency of Tones	Register			Total	%	Rāga/ Performer	Tones	Frequency of Tones	Register			Total	%
			Low	Middle	High						Low	Middle	High						Low	Middle	High		
I/1	Sa	122		6	5	11	9	I/2	Sa	71		7	4	11	15	I/3	Sa	141		1		1	1
	Ri	131							Ri	52							Ri	105		1		1	1
	Ga	164			9	10	6		Ga	82		2		2	2		Ga	126	1	1	3	5	4
	Ma	159				1	1		Ma	95							Ma	130		2		2	1
	Pa	105		7		6	6		Pa	82		7		7	9		Pa	123		4		4	3
	Da	46							Da	61		1		1	2		Da	112	2			2	2
	Ni	75							Ni	55							Ni	145					
	Total	793		13	14	28	4		Total	498		17	4	21	4		Total	882	3	9	3	15	2
II/1	Sa	60		5	5	10	17	II/4	Sa	71						II/2	Sa	76		11		11	14
	Ri	71							Ri	73							Ri	79					
	Ga	61		4	1	5	8		Ga	56		No Held Tones in II-4					Ga	90		3		3	3
	Ma	34							Ma	43							Ma	64					
	Pa	32		3		3	9		Pa	38							Pa	31	1	2		3	10
	Da	52							Da	57							Da	64					
	Ni	25							Ni	52							Ni	40					
	Total	335		12	6	18	5		Total	395							Total	444	1	16		17	4
III/3	Sa	64		4	5	9	14	III/5	Sa	96		3	5	8	8	III/6	Sa	124		4	3	7	6
	Ri	57		1	2	3	5		Ri	116		1	1	2	2		Ri	133		2	1	3	2
	(Ga)								(Ga)								(Ga)						
	Ma	33							Ma	94							Ma	97					
	Pa	54	1	5		6	11		Pa	127		2		2	1		Pa	111		3		3	3
	(Da)								(Da)								(Da)						
	Ni	65							Ni	98	1			1	1		Ni	119					
	Total	273	1	10	7	18	7		Total	531	1	6	6	13	2		Total	584		9	4	13	2

CHAPTER X

SUMMARY AND CONCLUSIONS

Ālāpana performance is an experience to the performer as well as to the listeners. Transformation of this experience into verbal communication is difficult, but an essential contribution to ethnomusicology which attempts objectivity in study about the content and context of music. This study attempts to present data on gamaka in recorded ālāpanas by reputed musicians, in three rāgas: Shankarābharana, Pūrvikalyāni and Madhyamāvati. The transcription provides both the graphic outline of the melody together with symbols of the ornamentation, and the solfège symbols. These represent visually some of the aesthetic elements of the sound. The visual transcription of the sound gives details of ornaments designated in this study as gamakas, accents, and stylistics.

In addition to the visual presentation of gamakas in ālāpana, gamakas are classified, and coded. The occurrences of each kind are counted and presented in tables which display distributions, totals, and percentages. It is true that the numbers and percentages are not music, and do not reproduce the details of music in experience--they do not pretend to capture experience. But these numbers and percentages display certain features of the music. Many important details of gamaka in the ālāpana performances of the corpus are brought out in these tables. To a performer in the Karnatic tradition, there is a degree of immediate recognition of experience when examining the tables.

Listeners, readers, scholars, and performers are aware that one performer sounds different from another when performing ālāpana in the same rāga. By examining the tables presented in this study, it is possible to see that the use of some gamakas rarely encountered in the performance of other musicians, and the following of personal preferences for different numbers of oscillations contribute to the recognizable individuality of a performer.

Should objective data and subjective experience be used together? By examining the transcriptions with the gamaka symbols placed above and below the melodic line--even without examining the tables--one can see the importance of ornaments in ālāpana. It can be said that an advantage of objective data is that they can be re-examined and analyzed by another person but one's experiences cannot. The utilization of classification, symbols, tables, and percentages facilitates comparisons of one performance with another, and of one rāga with another. In this writer's opinion, objective data and subjective experience complement one another.

In the performance of an ālāpana the musician reveals the essence of a rāga through its essentials which include gamakas specially associated with certain tones. The musician also exhibits individuality in rendering the rāga. These traditional beliefs are substantiated by the data presented in this study.

Ornaments with the highest percentage of use in the nine performances in the three rāgas are gamakas and stylistics of 2-tone slides with intervals of a 2nd to a 6th from above and below which connect melodic segments. Ornaments with the lowest percentage of use (as

little as 1% of the total performance) still may be significant in indicating a given performer's style.

There is more agreement in the proportion of ornamentation of tones among the three musicians performing each of Rāgas Shankarābharana and Pūrvikalyāni than among the three musicians performing Rāga Madhyamāvati. As believed in the tradition, not all tone occurrences are ornamented. The tones Sa and Pa are less ornamented than other tones. Within the tradition it is believed that these tones are not oscillated and are conceived as receiving no gamaka. The performance data substantiates that tones Sa and Pa are not oscillated but shows that they do receive some ornamentation--both gamakas and stylistics (comprised of two-tone slides) and accents. In general, in Rāga Madhyamāvati, the three performers exhibit more individual style and variety than in Rāgas Shankarābharana and Pūrvikalyāni.

Held tones are important to ālāpana. It has been found that the performers agree in using held tones which are specific to each rāga; at the same time the performers have individual styles in holding some tones which are not held by the others. Only one performer, a reputed and elderly musician, did not hold any tone more than one second--revealing one aspect of his style.

In conclusion, it has been found that certain tones of a rāga receive more ornamentation than others with those receiving the greater amount corresponding to the traditional belief. It has been found, in agreement with the tradition, that certain tones of a rāga receive specific gamakas, but also that they receive some other gamakas and ornamentation. It has been found that the traditional belief that all

occurrences of some tones receive gamaka is only rarely achieved in performance although it is often approached. Further, it has been found that within the norms of the traditional expectations for a rāga, the performer expresses an individual identity and concept of the rāga. It may be that this balance between satisfaction of expected treatment and of individual treatment of tones contributes to the high place ālāpana holds in the Karnatic tradition, for it is both the same and new simultaneously.

APPENDIX

GLOSSARY

ālāpana	improvisation on a rāga; also called rāga
Antara Gāndhāra	scale 3 variant in 12-tone system (Ga_2)
ārōhana	ascent of scale
audava	variety of varja rāga
avarōhana	descent of scale
bhakti	1. expression of devotional feeling while performing 2. devotion--a path to salvation
bhāshānga rāga	a class of janya rāga
bhāva	essence
Chatuśruti Dhaivata	scale 6 variant in 12-tone system (Da_2)
Chatuśruti Rishabha	scale 2 variant in 12-tone system (Ri_2)
Da (Dha)	solfège for 6th scale degree
dashavidha gamaka	grouping of 10 gamakas
Dhaivata, Dha; Da, (D)	6th scale degree
Ga	solfège for 3rd scale degree
gamaka	1. a class of ornaments 2. ornamentation
Gāndhāra, Ga, (G)	3rd scale degree
gīta	a song form
janaka rāga	parent rāga; also called melakarta and sampūrna rāga
janya rāga	derived rāga
jatisvara	a music type
jāvali	a song form

Kākili Nishādha	scale 7 variant in 12-tone system (Ni_2)
Kaishiki Nishādha	scale 7 variant in 12-tone system (Ni_1)
kalpanā sangīta	music improvised during performance; also called manodharma sangīta
kalpanā svara	an improvised music type
kalpita sangīta	music composed prior to performance
Karnatic [Carnatic] music	South Indian art music
kīrtana	a devotional song form
kriti	a song form
laya	1. rhythm 2. a sense of rhythm
Ma	solfège for 4th scale degree
Madhyama, Ma (M)	4th scale degree
Madhyamāvati	name of a rāga
manodharma sangīta	an improvised music type; also called kalpanā sangīta
mēlakarta	parent rāga; also called janaka rāga, sampūrna rāga
mukti	attainment of salvation through music
neraval	an improvised music type; also called sāhitya prastāra
Ni	solfège for 7th scale degree
Nishādha, Ni (N)	7th scale degree
Pa	solfège for 5th scale degree
pada	a song form
pallavi	1. first section of a kriti 2. an improvised music type
Panchama, Pa (P)	5th scale degree

prabanda	a song form
panchadasha gamaka	grouping of 15 gamakas
Prati Madhyama	scale 4 variant in 12-tone system (Ma_2)
Pūrvikalyāni	name of a rāga
rāga	1. germinal melody 2. improvisation on a rāga, also called ālāpana
rasa	mood
Ri	solfège for 2nd scale degree
Rishabha, Ri, (R)	2nd scale degree
Sa	solfège for 1st scale degree
Sādhārana Gāndhāra	scale 3 variant in 12-tone system (Ga_1)
sāhitya prastāra	an improvised music type; also called neraval
sampūrna rāga	parent rāga; also called janaka rāga, mēlakarta
sangīta	art music
shādava	variety of varja rāga
Shadja, Sa, (S)	1st scale degree, tonic
Shankarābharana	name of a rāga
śloka	1. Sanskrit poetic verse 2. an improvised music type
śruti	1. sense of pitch 2. 22-tone system 3. microtone
Sudha Dhaivata	scale 6 variant in 12-tone system (Da_1)
Sudha Madhyama	scale 4 variant in 12-tone system (Ma_1)
Sudha Rishabha	scale 2 variant in 12-tone system (Ri_1)
svara	Indian solfège

svarajati	a song form
svara jñāna	1. knowledge of svara 2. providing solfège to melody
svara sthāna	interval placement of 7, 12, 22 named pitches
tāla	time cycle
tambūra	4-string drone instrument
tāna	an improvised music type
tāya	plucking techniques for vīna
tillāna	a song form
upānga	class of janya rāga
vakra rāga	a class of upānga
varja rāga	a class of upānga rāga
varna	a music type

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